BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, APRIL 11th, 1936

THE TECHNIQUE OF GASTROSCOPY

BY

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The first attempt to examine the lining of the stomach by means of an endoscopic instrument was made by Kussmaul in 1868. The patient, or victim, was a professional sword-swallower. It goes without saying that the instrument was of the most primitive type, for it was only five years previously that endoscopy had been invented by Désormeaux (Fig. 1). It consisted of a straight metal tube with suitably placed mirrors lighted by a naked flame placed externally, for electricity had not been adapted to practical usage at that time. The next recorded attempt was by Mikulicz eleven years later.

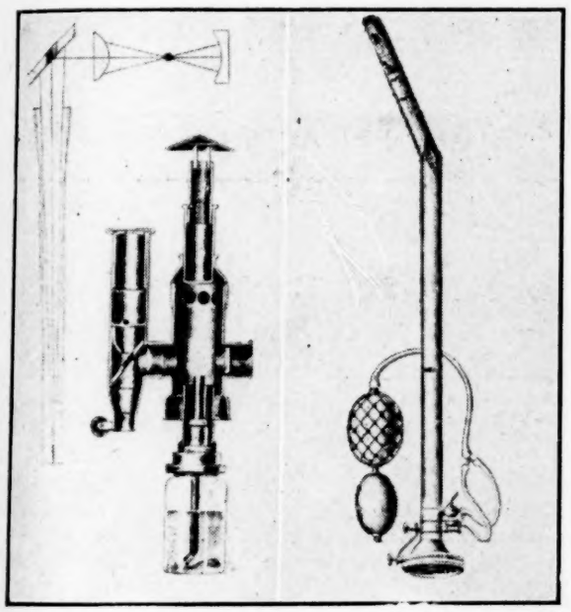

FIG. 1. FIG. 2.

FIG. 1.—The Désormeaux endoscope for urethroscopy. (After Moutier.)
FIG. 2.—The Mikulicz gastroscope. (After Moutier.)

By this time electrical illumination was available, and the Mikulicz gastroscope carried a terminal light. This instrument was constructed after the principle of the cystoscope, with a long and a short arm, and a prism in the angle formed between the two. It measured well over half an inch in diameter (Fig. 2), and was naturally a dangerous instrument to use. Mikulicz, however, claimed to recognize carcinoma of the pyloric end of the stomach with it—a very definite advance, it will be admitted, so long before *x*-ray examination of the stomach came into being. In the succeeding years many types of instrument were invented. Nitze and Leiter made a flexible one with terminal vision, and in 1899 Rewidzoff designed a gastroscope to the end of which a flexible guide could be attached to facilitate its passage into the stomach.

The problem confronting gastroscopists was twofold. It was necessary to devise an instrument which could be introduced into the stomach without danger and which would also give an adequate view of the inside once it had been passed. The two ideals were therefore safety and utility. The well-known gastroscope which Sussmann invented in 1911, an example of which I have in my possession, came a little nearer to satisfying both these ideals than any of its predecessors (Fig. 3). It is made of overlapping metal links, and is so constructed that it can be bent in one plane. It is passed into the stomach in this flexible state and then converted by means of a locking device into a straight and rigid instrument. At the distal end there is a revolving light and mirror, which can be turned through a complete circle by means of a wheel placed near the eyepiece. It has proved too dangerous an instrument, however, to be of practical value. My late colleague Mr. Arthur Edmunds, who introduced this gastroscope to King's College Hospital some twenty-three years ago, used to say that he

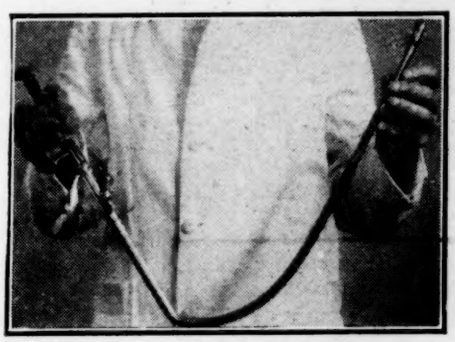

FIG. 3.—The Sussmann gastroscope.

personally would much prefer to submit to an exploratory laparotomy than to an endoscopic examination with this instrument.

The possibilities of endoscopy did not escape the attention of workers in this country. Mr. H. S. Souttar, working in collaboration with the late Dr. Theodore Thompson, designed and used a gastroscope the details of which were published in this *Journal* in 1909.[1] The advent and development of *x*-ray examination of the stomach appear to have inhibited advances in gastroscopy to some extent. Several workers, however, still persisted in their efforts with untiring zeal, amongst whom must be mentioned Korbsch, Hübner, Schindler, and Henning. In 1932, sixty-four years after Kussmaul's initial effort,

[1] *British Medical Journal*, 1909, ii, 843.

Rudolf Schindler, working in conjunction with the optical manufacturer Georg Wolf, designed an instrument which fulfilled the two ideals of safety and utility. The instrument is, indeed, a triumphant conclusion to the researches of nearly seventy years. It has converted a dangerous examination, the results of which were frequently inconclusive, into one which is without danger and the results of which are of very definite value.

The Wolf-Schindler Flexible Gastroscope

The essential difference between the Wolf-Schindler gastroscope and its predecessors is that its lower or distal portion is made of rubber and is thus flexible (Figs. 4 and 5). The most remarkable feature of this ingenious instrument is that the flexible part can be bent to a considerable angle in any direction without interfering with the visual field. This is made possible by a system of convex lenses situated within the flexible portion itself. The whole instrument measures 74 cm. in length, and can be divided for purposes of description into three parts. The first and third parts are rigid and the middle one is flexible. The first (or distal) part consists of a metal piece carrying a light and the objective eyepiece, and is surmounted by a round rubber sponge to wipe away mucus from the oesophagus and to act as a cushion between the instrument and the greater curvature of the stomach. The angle of vision is about 90 degrees. The light is an extremely brilliant one, taking current from a 9-volt battery.

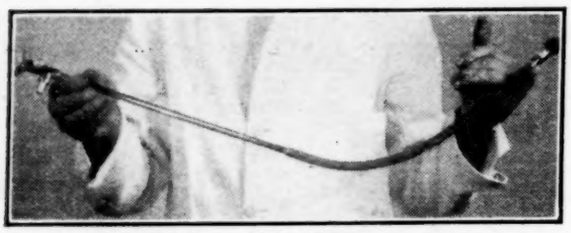

FIG. 4.—The Wolf-Schindler gastroscope.

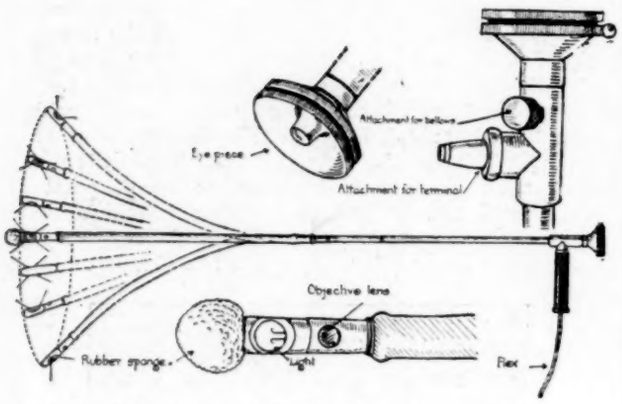

FIG. 5.—Scale drawing of the flexible gastroscope to illustrate how the flexible part may be bent. (1/4 size.) The drawings of the eye-piece and the distal end are actual size.

The second (or flexible) part carries the optical system of lenses. It measures some 11 mm. in diameter, 27 cm. in length, and is made of a durable rubber. The wall consists of two rubber tubes, one lying inside the other, the space between them forming the channel along which air is blown into the stomach during the examination, the outer tube being perforated by four tiny holes situated near the distal end. The complete safety of the examination is due to this flexible portion, for its degree of flexibility is such that it can lie within the cardiac orifice without damaging it, and is capable of bending when the distal part of the gastroscope comes into contact with the greater curvature of the stomach. With the instrument fully introduced the beginning of the rigid portion lies about 4 cm. above the cardiac orifice and 2 cm. above the oesophageal opening in the diaphragm.

The third part of the gastroscope is rigid, is of narrower calibre than the first and second parts, and measures 34 cm. in length. Some 8 cm. from the attachment of the flexible part the rigid part has a marking on it; when this is opposite the incisor teeth the distal end of the gastroscope has passed through the cardia into the stomach. The end of the rigid part carries an eyepiece, which, like that of the cystoscope, has a knob at its edge corresponding in position with the objective lens, and two arms, one for the attachment of the light switch on the battery and one for the attachment of the bellows. The instrument is a delicate one, and requires great care in handling and maintenance. It can be cleaned with water and sterilized with alcohol.

FIG. 6.—Radiograph of the gastroscope in position. While this radiograph was being taken the pylorus was under observation.

The field of vision is circular, and the object is seen with remarkable clearness. After bending the flexible portion beyond a certain point the circular field becomes deformed. This point is said to be reached when the flexible part makes an angle of about 35 degrees with the vertical, but actually with the latest pattern instrument the angle to which the flexible part can be carried, provided it is curved gently and not abruptly, appears to be much greater than this, and by rough measurements is approximately 60 degrees. In practice, however, the flexible part never becomes bent when the gastroscope is *in situ* to anything like this extent, for once the instrument is in the stomach it behaves in very much the same way as the rigid type, and does not do more than bend in a very gentle curve (Fig. 6).

What has been said regarding the field and the angle to which the rubber part can be flexed holds good for all points of the compass That is to say, if the eye-

piece be held firm the rubber part can be pointed north, south, east, or west, or towards any intervening point on the compass (Fig. 5), and the field remains intact provided the angle to which it is bent is not too great, and provided also that a double curve is not introduced. When the latter occurs the field is immediately interfered with and may completely disappear, even if the curves are slight. This may happen in practice if care has not been taken beforehand to see that the patient is lying in the correct position.

Operative Technique

Before gastroscopy is undertaken the patients will have had an *x*-ray examination of the stomach. This is necessary, in the first place, to exclude contraindications to the use of the gastroscope, and in the second, to define more clearly the indications. The chief contraindications are oesophageal stricture, aortic aneurysm, and oesophageal varicosities.

It used to be my practice to admit patients for examination the day before the operation ; this has been found to be unnecessary, and they now attend as out-patients. The only instructions that are given to them are that they

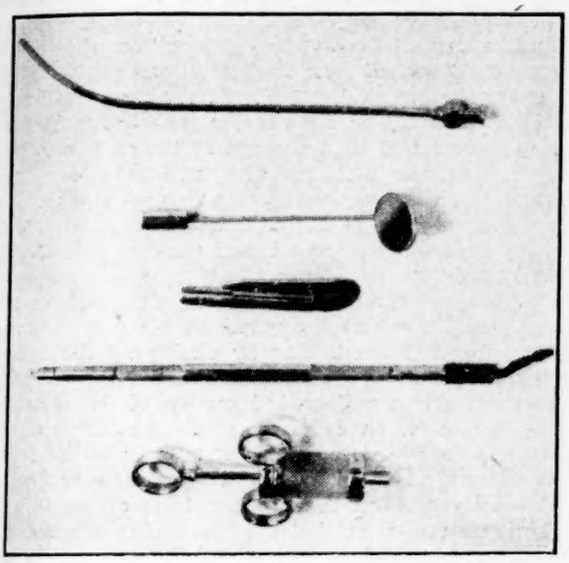

FIG. 7.—The instruments used for applying the local anasthetic.

should not take any breakfast the morning of the examination, which is done at 10 o'clock. Further, following the practice of Henning, I used to give all patients an injection of morphine and atropine before the operation, but I have now dispensed with any premedication of this kind as I have frequently found it to be upsetting and its disadvantages, therefore, to outweigh any advantage. Shortly before gastroscopy a gastric residuum tube is passed and the residuum is withdrawn in the ordinary way and sent for analysis.

A local anaesthetic of 2 per cent. decicaine, to which a little adrenaline is added, is used. The instruments for its application are illustrated in Fig. 7. They consist of a short 5 c.cm. syringe, a long curved cannula, the last inch and a half of which is perforated and roughened so that it can hold a swab after the manner of a Playfair's probe ; and a tongue depressor and a laryngeal mirror, each of which may be fitted to an apparatus holding an electric light. The anaesthetic should be as complete as possible, and there should be no hurry, therefore, over its application, which usually takes about five minutes. The base of the tongue, soft palate, the inner side of the cheek, and the gums are first painted with the solution and then the tonsils and the posterior wall of the pharynx. With the aid of the laryngeal mirror the epiglottis is then painted back and front, and finally the cannula is passed down through the pharyngo-oesophageal sphincter. This part of the anaesthetic is of very great importance, for spasm of the muscle may give rise to considerable difficulty. In all 3 to 4 c.cm. of decicaine are used. In only one case in my experience have there been any grounds for suspicion that this amount may give rise to toxic symptoms.

After allowing 5 to 10 minutes for the anaesthetic to take full effect the patient climbs on to the table and lies on his left side. The table should have a back rest for the patient to lean against, and should be capable of the Trendelenburg position (Fig. 8). The patient lies loosely, with his back leaning against the rest and the knees flexed. The head is steadied between the hands of an assistant and is held well back so that as straight a line as possible is made from the teeth to the cardiac orifice, and the eyes are covered with a piece of gauze. Very careful attention must be paid to the correct posture of the patient. Rarely is much difficulty encountered in passing the instrument, but if the patient is incorrectly placed and a double bend is made in the flexible portion the field of vision may be considerably reduced or even cut off altogether. Under such circumstances it is probably wise to withdraw the instrument and to rearrange

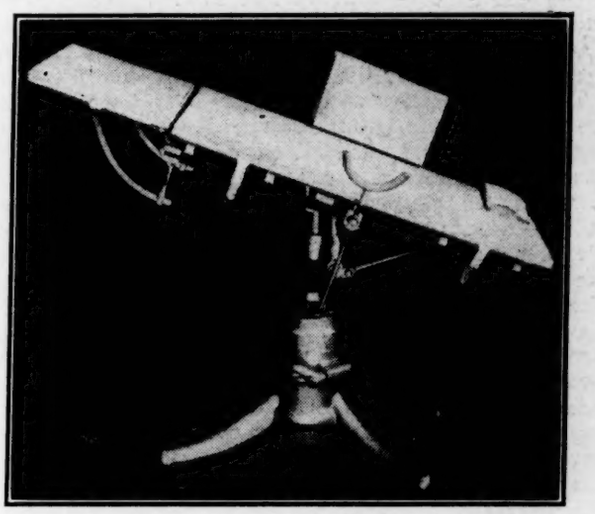

FIG. 8.—A suitable table for gastroscopy. The patient lies on his left side with his back against the rest. The Trendelenburg position is used only if excess of residuum in the stomach obscures vision.

the patient. The left side is chosen, as in this position the lesser curve, antrum, and pylorus may best be inspected.

The instrument is now thoroughly moistened with water. The surgeon wears a glove on the left hand, and the first and second fingers are placed in the patient's mouth and passed towards the base of the tongue, gently pressing it forward. The eyepiece end of the gastroscope is held by the assistant, and the operator takes the distal end in the right hand, passing it into the mouth between the first and second fingers of the left hand ; the latter serve to guide the instrument to the posterior pharyngeal wall. During this manœuvre the gastroscope is at right angles to the patient, but when the posterior pharyngeal wall is reached it is brought slowly into line with the oesophagus, the left hand is withdrawn, and the instrument gently pushed downwards. The resistance of the pharyngo-oesophageal sphincter may be felt, but is overcome by gentle pressure ; the patient may give considerable assistance if he swallows. Once past this region the gastroscope is rapidly passed down the oesophagus until the resistance of the cardiac sphincter is felt. The resistance here is variable ; it may be so slight as to escape

notice, but in no case is it very marked, and the gastroscope passes into the stomach easily after a moment's pause. The mark on the rigid part should now be opposite the teeth. It is of very great importance to avoid pinching the tongue or cheek against this part of the instrument. This stage of the operation should be performed as rapidly as possible, though of course no force must be used.

The bellows and light terminal are now attached and a little air is blown gently into the stomach and the rest of the introduction is made under vision. The instrument can be passed still further until it comes into contact with the greater curvature. This gives rise to a dull pain in the stomach, which in some cases causes considerable distress. It is not always necessary, however, even for a complete examination of the stomach, to pass the instrument thus far. In cases in which the discomfort produced is slight, the instrument can be passed to its fullest extent, the distal end being inclined somewhat towards the pylorus along the greater curvature so that the objective lens is brought nearer to the outlet of the stomach. While this is being done air is gently blown into the stomach so as to produce a sufficient degree of distension, and to blow away any bubbles that may obscure vision. With the patient thus lying on his left side all the fluid remaining in the stomach collects at the now most dependent part, which is near the splenic portion of the greater curvature. This collection can be seen as a white pool, to which the French authors apply the term "lac muqueux."

The actual operation causes very little discomfort in the average case. Much depends, of course, upon the type of individual with which one has to deal. In none of my cases so far has there been a failure to introduce the gastroscope into the stomach. In one patient, a man of 65, who subsequently underwent a partial gastrectomy for a very large ulcer high up on the lesser curve, gastroscopy was, he said, the least unpleasant of all the measures he had undergone. Curiously enough the ones he liked least were the injections of larostidin, which were given during the preliminary and unsuccessful medical treatment. On the other hand, a woman, aged 55, stated that she would prefer to have any one of her thirteen children over again rather than have the examination done. Nevertheless, this patient has submitted to gastroscopy on three occasions!

The Normal Stomach

In a favourable case practically the whole of the stomach mucous membrane can be seen. The fundus, however, (that is, that portion which rises above the level of the cardia) is not visible by means of the ordinary gastroscope, but can be inspected by means of the retrograde instrument devised by Henning of Leipzig, an instrument of which I have had no experience. The fact that this part of the stomach cannot be seen is not of very great moment, because it is so rarely that pathological conditions affect it. The pool of mucus which collects at the splenic aspect of the greater curvature obscures also that part of the lining of the stomach. The size of the pool varies considerably in the normal, sometimes being quite small. Its presence, however, is very useful, because it serves as a landmark. Another area which in the normal stomach cannot adequately be seen is the greater curvature of the pyloric antrum. The pylorus itself can be seen in most cases. Frequently it is obscured by the anterior antral pillar, but in some of these cases, when a peristaltic wave comes down the stomach, it has the effect of swinging the pylorus into the visual field. The distance of a lesion—for example, a chronic ulcer—from the cardiac end of the stomach may be calculated by subtracting from 24 cm. the distance in centimetres between the teeth and the proximal end of the gastroscope.

In colour the normal gastric mucous membrane can best be described as a dark orange, and in this respect it is quite different from the mucous membrane of other regions accessible to endoscopy, such as the rectum and the bladder. The surface is always moist, and consequently shines very brilliantly. The rugae in the normal stomach vary in size according to the degree of distension. Their presence causes shadows, and as the stomach is continually altering its shape very complex light effects are produced, which are somewhat disturbing to the inexperienced gastroscopist. The movement of the stomach is due partly to respiration, but chiefly to peristalsis. All these factors make gastroscopy a more difficult procedure in many ways than endoscopy of any other hollow viscus. The stomach is not nearly so well behaved, for example, as the bladder. Its shape continually alters, uniform distension cannot be obtained, and the irregularities of its contour make its inspection by endoscopy by no means easy. However, these difficulties can eventually be overcome by experience, but this experience must be obtained upon the living subject, for neither the cadaver nor the phantom stomach is of any use whatsoever in this respect.

The study of gastric movement which endoscopy allows is extremely fascinating, and I think the impression one gets of the stomach is entirely different from that which one previously derived from anatomical and physiological, and perhaps radiological, study. In the normal stomach peristaltic waves follow one another steadily and pass as rings, slightly raised from the rest of the stomach, from somewhere in the proximal end to terminate in the pylorus. In an actively contracting stomach two or more such waves may be in the field of vision at the same time. They produce a great bar of stomach wall, largest at the greater curvature aspect, which steadily migrates towards the pylorus, obliterating the definition of the antrum, and converting the antral chamber into a cone-shaped space and terminating by closing up the pyloric opening.

The antrum is a well-marked portion of the stomach. It has, as a rule, no definition at its greater curvature aspect, and its limit is usually defined by a wall forming about seven-eighths of a circle. Occasionally, when peristaltic waves come down, the antrum contracts with a sphincteric action, so that the antral chamber becomes shut off completely from the body of the stomach, and one thinks at first that one is looking at the pylorus. The manner of closing of the pylorus can be observed very closely in many cases. In the relaxed state it is a circular opening with a slightly crenated edge, and the dark grey lumen of the duodenum can be seen beyond it. When it contracts its walls rapidly swing together, and may remain in this state of contraction for some seconds. As the wall contracts a little of the mucous membrane from the duodenum may pout into the stomach, and with it a little bile may regurgitate.

The chief landmarks are the "lac muqueux" and antrum, and, of course, the pylorus when this is visible, but there are very distinct differences in the minute anatomy of the various parts of the body of the stomach which the gastroscopist eventually learns to appreciate. It is some time, however, before he can declare with confidence at what part of the stomach he is looking at any given time. The knob on the eyepiece of the instrument greatly helps orientation. The lesser curve of the stomach can readily be recognized by the fact that it has no rugae, but presents a smooth shining surface to inspection. The rugae on the anterior and posterior walls, however, are very numerous and well defined, and their definition increases as the greater curvature of the stomach is reached. They are arranged very much like the convolutions of the cerebrum, and their general tendency of

direction is in the long axis of the stomach. They are most numerous on the posterior wall near the greater curvature and towards the proximal end of the stomach. The depth of the depressions between the rugae, and therefore their thickness, vary according to the degree of distension to which the stomach is subjected.

With the patient lying in the left lateral position the stomach is " J "-shaped, and the lesser curve makes almost a straight line until the antrum is reached. Thus the latter can be inspected with the instrument lying practically straight in the stomach. However, if the stomach is looked at from above in this position it is not in one plane, but the pyloric end turns slightly backwards. Moreover, the opening of the pylorus is not situated exactly at the end of the " J," but is placed a little towards its anterior and upper wall. During the examination air has constantly to be blown into the stomach, in order to keep its walls under tension. Excess of air is to be avoided, although there is little danger of damaging the stomach in any way, even if an ulcer be present, because the air can escape so easily, either into the duodenum or through the cardia alongside the gastroscope. It is essential not to distend the stomach too greatly for the patient's comfort, for it might cause him considerable distress, both mentally and physically, should he involuntarily belch up a lot of wind when the examination is in progress. The distension should be sufficient to hold the walls of the stomach away from the end of the gastroscope and to blow away any " bubbles " that may interfere with vision. The duration of the examination itself should not exceed five to six minutes, which is long enough for the average patient, although on many occasions examination has been prolonged for a quarter of an hour or so. The patient complains of no other discomfort than of having some soreness of the throat on the day following the examination.

Indications for Gastroscopy

Gastroscopy is unquestionably a very useful addition to our methods of investigating cases of gastric disorder. Whether it will become a routine method, as cystoscopy has in diseases of the urinary tract, is a matter that will be decided in years to come. It must be remembered that modern gastroscopy is in its infancy, for it is only four years since the Wolf-Schindler instrument, which has made gastroscopy a practical procedure, was invented. It can never replace radiological examination, which must be made first, in order that all contraindications to gastroscopy may be excluded. Its present indications may be summarized thus:

1. Cases in which there is reason to suspect a lesion in the stomach despite negative radiographs—for example, chronic gastritis.

2. Cases in which the *x*-ray examination shows evidence of a lesion affecting the stomach, but does not give sufficient information for a definite diagnosis to be made —for example, persistent spasm, deformity as the result of an extragastric lesion, gastro-jejunitis following gastro-enterostomy.

3. Cases of chronic ulcer of the stomach in which doubt exists as to whether or not the ulcer is malignant.

4. To confirm the *x*-ray diagnosis in rare conditions—for example, simple tumour of the stomach, polyposis ventriculi.

In addition to these absolute indications gastroscopy is of very considerable value in checking the results of medical treatment of chronic gastric ulcer. It provides the most reliable criterion of the healing of an ulcer.

I wish to disclaim any originality in the technique described, which is in the main an imitation of that described by Schindler and practised and taught by Henning at Leipzig.

LATENT ADOLESCENT PULMONARY TUBERCULOSIS

BY

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AND

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This investigation is the fifth of a series[1 2 3 4] from the Brompton Hospital Research Department on the pathogenesis of pulmonary tuberculosis.*

The relatively large number of young adults who are admitted for treatment in our tuberculosis institutions with already extensive disease causes grave concern. It is a common experience that in a considerable proportion of these cases the symptoms of ill-health that lead them to seek medical advice are slight in proportion to the lung lesions present. Further, these symptoms are mainly of comparatively recent appearance.

In short, too many patients do not seek treatment until their disease is well entrenched. This undoubted fact is the reason why our tuberculosis service spends most of its energies, time, and money in endeavouring to patch up hopelessly damaged individuals by preventing the further activity and inroad of the disease. This is attempted either by making use of the natural means of healing promoted by prolonged rest, or inducing some form of mechanical collapse which, though of great life-saving value, must be regarded as a drastic method of treatment—a last resort made necessary by the gravity of the situation. Nor are the results really good. The treated patients can seldom take up again an *absolutely* normal life in the healthy community. Many do so, or appear to do so, for a time, but it is usually at the price of self-denial and restraint on their part and trouble and expense on the part of their friends, relations, or public assistance bodies. Financial circumstances force most of our working-class patients to try to make this desperate attempt, and they do it at great risk: in fact, one might say that they risk their lives to get their living. Over one and all of them hangs the shadow of that sword of Damocles —relapse. The cause of this state of affairs is that pulmonary tuberculosis is, during long periods of its activity, often a symptomless disease. This is well known to most observers, and lately actual statistical proof of it has been published.[5]

Latent Lesions

Another observation has been made by one of us—namely, that in taking detailed histories of recently diagnosed adult cases there is often a suggestion of a definite period of ill-health in adolescence which might, in the light of their present state, be ascribed to active pulmonary tuberculosis, but which had not been recognized as such. As examples may be mentioned pleurisy, atypical pneumonia or bronchitis, anaemia, and nervous breakdown for no known cause.

The combination of these two observations led to the formation of a nebulous hypothesis that perhaps the extensive lesions of adult disease are really in many cases deposited during adolescence with the accompaniment of slight or, at any rate, unexplained constitutional disturbance: that these lesions are carried unrecognized, perhaps extending slowly and without symptoms, until they make their presence known in adult life, either by reason of

* The expenses of this investigation were defrayed by the Halley Stewart Trust, with further help from donations collected and presented by Sir Alexander Roger.

their spread past a definite point or because some environmental cause has allowed of their reactivation.

Lines of the Investigation

The testing of this hypothesis seemed at first sight a simple matter. If it were true, the radiological examination of a sufficiently large unselected sample of the adolescent working-class population in normal health should reveal a proportion of cases with definite lesions. Further, the incidence of these lesion-carriers should closely approximate to the incidence of clinically manifest tuberculosis in the adult working-class population between the ages of 21 and 40.

This method of solution was not found so simple in practice. It was realized that volunteers could not be obtained in sufficient numbers if they were asked to come to any hospital radiological department for examination; therefore the *x*-ray apparatus would have to be taken to the volunteers. This necessitated the use of a portable apparatus, a great but inevitable disadvantage. However, a Watson's "Sunic Junior" apparatus was obtained, and experiments were made with it. It was found that, although the films were perhaps not good enough for delicate diagnostic work, yet they did show quite clearly definite lesions of the type that we were searching for. It was judged, therefore, that the apparatus was adequate for our purpose, for it was obvious that in this investigation we should not concern ourselves with primary foci, nor with slight shadows of doubtful significance, but only with definite lesions of the adult type.

Our next problem was the source of volunteers. With the helpful co-operation of the Surrey County Council, through the good offices of Dr. Ferguson, County Medical Officer of Health, we were allowed to approach the scholars in all the county secondary schools, and from these a very good response was obtained. In this way 1,350 cases of both sexes between the ages of 14 and 18 years were examined. It was felt, however, that these individuals were not a true unselected sample of their class, being indeed rather picked adolescents whose environment was better than that of their less fortunate brothers and sisters who had had to start earning their living at the age of 14.

We therefore approached several employers of adolescent labour and, after many rebuffs, through the kindness of Messrs. Gale and Polden of Aldershot, the John Lewis Partnership, The United Dairies Ltd., Messrs. Rowntree and Co., Messrs. John Heathcote and Co., and the Mary Ward Boys' Club, we were allowed to approach their employees and members, and to examine them during working hours at the factories and shops. In this way 1,031 more cases were obtained, making a total of 2,381 cases of the adolescent, urban, and semi-urban working-class population between the ages of 14 and 21, and we felt that this number was large enough to give us the answer to our question.

Interpretation of Findings

Our difficulties were not yet over. We had made no selection of our material at all. These adolescents were, so far as we knew, in normal health—that is to say, they were on full working or school hours. Radiological examination was our sole test. But when confronted with the *x*-ray film of any individual's lungs without any knowledge of his clinical condition, if any abnormal shadows are seen, it is only possible to say that these shadows have been thrown by lesions and that these lesions may be due to certain various pathological causes; it is not possible to say that they have been thrown by some particular pathological lesion.

At the same time we both have a wide experience of the *x*-ray appearance of the lungs in health and in disease, and we are well acquainted with the *x*-ray appearances of tuberculous lungs, and are both agreed that tuberculosis is by far the commonest cause of distinct and lasting *x*-ray changes in the lung field. In examining this series, then, we have taken as "positives" those films in which there were *unmistakably abnormal shadows, indicating very definite pathological changes in the lung parenchyma, having the appearance which was compatible with, and usually associated with, tuberculous lesions of the adult type.* We definitely stress the words "adult type," for these were the lesions we were searching for; all evidence of primary foci of infection (the Ghon focus), with the corresponding calcified tracheo-bronchial glands, though numerous, was ignored.

We frankly admit that this is a weak link in our investigation from the scientific point of view, but time, money, and other practical factors made further examination of these adolescents impossible. Although we know that the abnormalities in almost any chest film of a tuberculous case could be explained as being due to other pathological causes, yet we feel that our colleagues will agree that, as we kept very strictly to our standard set forth above, and discarded as negative those films in which we believed that the abnormalities might more easily be ascribed to causes other than tuberculosis, our results may be taken as approximately correct.

Results

In the 2,381 films there were fifteen (0.65 per cent.) positives. In addition, there were eighteen abnormal films, and ten of these showed shadows probably due to tuberculous lesions. We therefore found a definite incidence of 0.65 per cent., and a possible incidence of 1.08 per cent.

Similar investigations based on the *x*-ray evidence of unsuspected pulmonary tuberculosis in groups of young adults have been undertaken by workers in other countries. In the United States latent lesions of an adult type among university students were found in 3.9 per cent. of cases by H. Hetherington, F. McPhedran, and others,[6] in 1.8 per cent. by W. B. Soper and J. Wilson,[7] and in 1.5 per cent. by R. H. Steihm.[8] Among school children between the ages of 15 and 19 years, positive reactors to intradermal tuberculin tests (83 per cent. of the children) showed 1.6 per cent. with radiological evidence of an adult type of lesion.[9] Of young applicants for employment in a firm in New York 1 per cent. were found to have evidence of definite tuberculous lesions when radiographed.[10]

In Germany and Spain the figures show 2 per cent. of university students at Munich (Kattentidt),[11] and 4 to 5 per cent. of students in Barcelona (Sayé).[12] In China, among the professional classes, G. Hall and C. Chang found definite *x*-ray evidence of pulmonary tuberculosis with no clinical evidence of the disease in as many as 17.9 per cent. of young adults.[13] Apart from the experience in China, which is obviously not reflected in Western nations, these observers have found a much higher incidence of latent lesions than we have. We feel we are justified, therefore, in considering that our figures do not over-estimate the situation.

Deductions

How do these results affect the hypothesis? Because of the inherent weakness of the method of investigation which we have mentioned, the results cannot be allowed either to give a clear answer to our question or to turn the hypothesis into an accredited theory, but, if fairly

and carefully examined, they do put the hypothesis on a much firmer footing, very much firmer if weight be given to the figures from other countries. The actual incidence of clinical pulmonary tuberculosis in our working-class population is unknown. Dr. Lissant Cox has calculated it to be about 0.4 per cent.,[14] Dr. Drolet of New York puts the figure at 0.75 per cent. for all adult males and 0.5 per cent. for young adult females.[15] These figures are guesswork, but at present are all we have as a guide to direct our calculations.

For ease of calculation, and to test our hypothesis more severely, let us take these estimated figures as minimal and assume that the incidence is even higher. Now the lesions of these cases of adult clinical tuberculosis must be either recently deposited or else exacerbations of older lesions. Our investigation shows that between 0.5 and 1 per cent. of the adolescent working-class population carry tuberculous lesions demonstrable by *x* rays, and in all probability they contain living tubercle bacilli.

What happens to these lesions and to their hosts? Are we to suppose that the lesions remain latent for ever or disappear? Our experience of their behaviour in diagnosed cases of clinical disease does not support such a contention. We know that such lesions are always liable to spread and to intensify; they usually do so, even though they remain stationary and symptomless for long periods at a time.

These working-class adolescents are often subjected to great and prolonged physiological strain. During that period when the normal animal is using all its energies for proper development into the adult state they have to work, work hard, and often work continuously, in conditions of bad atmospheric pollution and debarred from the normal amount of sunlight. Their natural desire for the recreations and frivolities of youth tempts them to steal for these many of the few remaining hours out of the twenty-four that should be given to rest. Many of them experience definite privation, lack of proper food, and anxiety.

These are well-known aetiological factors in the pathogenesis of pulmonary tuberculosis, encouraging and precipitating the activity of latent lesions. It is inevitable, therefore, that a very definite proportion of these adolescents with their latent lesions will sooner or later exhibit clinical disease, and we must note that the incidence of these latent lesions among adolescents approximates closely to the estimated incidence of clinical disease among adults. It is impossible to say what proportion of the adult cases of clinical disease are due to recently deposited disease or to the spread of latent lesions, but since in the age group from which they have emerged we know that there was at least an equal incidence of lesion-carriers who will probably develop clinical disease we shall not be unfair if we say that a very definite proportion of these adult clinical cases must be the end-result of latent adolescent disease.

So far our investigations support our hypothesis. They give it sufficient standing to permit of a logical corollary, which is its application to the problem of prevention of tuberculosis. It is recognized that the incidence of infection by the tubercle bacillus in adults and adolescents in civilized communities is very high, irrespective of actual known contact, and that also the incidence of clinical tuberculosis is very low relative to this high incidence of infection; obviously, therefore, it is unprofitable and unnecessary to attack the problem of the prevention of tuberculosis for the whole community along the lines of prevention of infection.

It is universally agreed that the task of preventing activity or relapse in a case with slight lesions and no constitutional disturbance is a trivial one compared with that of arresting activity and maintaining that arrest when lesions are dense and extensive, and when general resistance has once broken down. Therefore, if the problem were attacked, for the present at any rate, along the lines of detecting if possible that small proportion of the inevitably infected adolescent population who are going to suffer later from clinical disease, the saving of life, personal distress, and public funds that should result must be indisputable.

Practical Implications

The significance and implications of this are tremendous. If these adolescent carriers can be detected it is comparatively easy to handle them so that they shall never develop clinical disease, or so that the development in them of clinical disease shall be postponed until much later in life—every year of postponement making such development less likely. This, if successfully attempted, would imply the reduction of the much-deplored young adult mortality by whatever proportion these adolescent lesion-carriers contribute to the adult clinical cases. It must also reduce the amount spent on the institutional treatment of the working-class population between 21 and 40 years by the same amount.

Why should this not be done? Because we cannot see, should we ignore? The mentally defective, the blind, the orthopaedically crippled, those with cardiac disease, and epileptic adolescents are dealt with, protected, and treated at great expense because their lesions or their incapacity are obvious and can be seen, though it is to be noted that the cause of their incapacity, however great, is not necessarily fatal. How much more important, then, is it to endeavour to protect or treat the tuberculous adolescent who, although he may be momentarily free from incapacity, and although the lesion is not visible to the naked eye, yet is just as surely doomed to a permanent, partial, or complete incapacity, and almost certainly to death!

We may well be asked if we really suggest the introduction of such expensive and far-reaching reforms as our conclusions, based on such slender evidence, imply. To this we would reply that the steadily declining death rate from tuberculosis may be regarded with a certain amount of satisfaction, but the young adult death rate, which is not declining, cannot be so regarded. A declining death rate for all ages, including those over 50 years, is of little communal importance compared with a sustained death rate between the ages of 20 and 35 which is a communal menace. Since this menace is not yielding to our well-meant but apparently misdirected efforts—efforts which are based on the conception of the pathogenesis of pulmonary tuberculosis of thirty years ago—conservatism can have no excuse. The implications of more recent thought and fresh evidence, tenuous though it may be, should be followed, and should warrant a renewed attack on this menace from a fresh angle.

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ORGANIC BASIS OF A PSYCHOSIS

REPORT OF A CASE

BY

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Although the field of the psychoneuroses has for long been rather loosely recognized as one of "functional" disorders, the use of this term in relation to the psychoses has rightly been regarded with some suspicion. The debatable ground between functional on the one side and organic on the other is treacherous in the extreme.

Dubois and Déjerine, two most important workers in the investigation of the neuroses, indicated almost fifty years ago how clearly definite physical symptoms could be shown to have a purely functional origin and how readily they would yield to psychotherapy. They both pointed out two important truths—namely, that in any functional neurotic disorder there might well be some superadded real organic disturbance which should always be carefully sought for and recognized by both physician and patient, and also that in their experience persuasion and discussion were useless as applied to, for instance, a case of paranoia.

In connexion with this point it is interesting to recall that Freud mentions a case of a patient who was treated for some time as hysterical when, in fact, she was afterwards found to be suffering from an inoperable retroperitoneal sarcoma. Adolf Meyer also has mentioned a patient suffering from tabes mesenterica who for years was exposed to what he calls a "mental hygiene attack" on her illness.

On the other hand, the literature is full of examples of unfortunate individuals who have been exposed to surgical intervention for purely functional conditions whereby incalculable harm resulted. A personally observed case was that of the removal of an innocent appendix where the boarding of the abdominal muscles and local pain were due to changes in tonus caused by encephalitic sequels. Von Economo, in his work on this topic, himself mentions this type of occurrence.

These brief, flagrant references illustrate the complexity and duality of the position, and it is felt that this case is a forcible example.

The Patient's History

The patient was a single woman aged 40. Her complaints were expressed in vivid terms:

1. Tinnitus in both ears, which she described as "pandemonium." It was associated with long-standing deafness on both sides, which was due to middle-ear catarrh resulting from a severe degree of cleft palate, *via* the development of nasopharyngeal and Eustachian catarrh. The cleft palate considerably affected her speech, and materially assisted in producing the attitude of mind out of which her psychosis appeared to develop.

2. Severe pain, described as "burning agony" all over the brow, extending from the orbital margin to the roots of the hair and laterally into the temple. She said that when she pressed her brow it aggravated the pain, and she felt as if air were rushing into her head.

3. Her mental state arose out of the two foregoing features. She was extremely agitated and morbidly depressed. She said that the tinnitus and pain indicated that her brain was decaying, and that the condition had been caused by poison in her food, gas, and electrical influences. She stated that this plot against her life and sanity had been commenced by her stepmother, and was being carried on by communists.

So far the condition, although serious, was not of a nature to excite unusual interest. It appeared to be a straightforward example of agitated depression with hypochondriacal features and the usual nihilistic idea of loss of the contents of the head together with difficulty in thinking, and the not uncommon appearance of paranoid features. This impression was confirmed by a review of the life history of the patient and an estimate of personality, both of which formed a case history of the classical "reactive-dynamic" type.

She was the younger of two children. Her mother died soon after the patient was born, and she became devotedly attached to her father. This natural devotion seems to have been unduly effective in modifying her behaviour. After a normal school life she showed excessive repugnance to the advances of young men, and explained that her father needed her. Unfortunately this did not appear to be the case, for he married again, very much against the patient's wishes, and she was much upset. Even this, however, did not enable her to make a satisfactory adjustment in her relations with men. Her attitude to her changed home conditions was in terms of her personality make-up. This had apparently always been of the type prone to develop dominant notions, and was rigid, uncompromising, and essentially lacking the ability to make adjustments or adaptations. This temperament had been present from her earliest years, and she had always been "difficult." In spite of her inability to adapt herself to the changed home conditions where she was no longer mistress, owing to the advent of the stepmother, she was unable to realize the need for a career of some kind, and stayed at home nursing her grievance.

About this time war broke out and she served with the forces for several years. During this period she was well and happy. It is quite striking that this implied nothing to her, and she returned home to a domestic situation none the wiser for her absence. Almost immediately she developed, as might have been expected, a mild attack of depression. This was cleared up in an interesting way. The attack seemed to have been of the mild psychoneurotic type, without any distortion of the thinking, but with the appearance of fatigue symptoms as a depressive equivalent. In addition, however, she complained of pain in the lower part of the face on both sides. She was taken to a rhinologist, who, after *x*-ray examination, washed out the maxillary sinuses. This procedure was followed by a gradual clearing up of the depression. It is interesting to observe that this depression appeared to be reactive to her return into an intolerable home situation, and also that she had not enough insight to seek an occupational outlet in some other environment. One is tempted to wonder if the subsequent history would have been altered if psychotherapeutic aid had been present at this time.

During the post-war years the situation gradually became worse. She pursued no occupation, and by degrees became more averse and hostile to the home situation. To this was added the usual suspiciousness of the deaf person, for by this time the deafness was becoming severe. Considerable conflict arose in her ambivalent attitude to her too well-loved father. She felt that he had wronged her by marrying again. Unwilling to accept this, she evolved the idea that he had really not wished to do so. Her attitude to her stepmother became unbearable. She lived in an atmosphere of fancied slights and imaginary insults, for all of which she blamed her stepmother.

After some years she became definitely depressed, and showed typical symptoms. She was sad and fearful; she blamed herself for things she had done, all of them quite insignificant. She said her head felt empty and

that she could not think. Shortly afterwards she began to complain of the tinnitus. She did not complain of the deafness, which had developed so gradually that she had become used to it. The depression allowed opportunity for sharper focusing on the tinnitus, which accordingly became worse.

With the development of formal psychotic symptoms there came the severe pain which formed the major part of her complaint when she was seen by us. She stated that the first appearance of the pain had been after her stepmother had given her a glass of wine, and that thereafter the pain had been almost continuous. She also stated that her stepmother had enlisted the aid of Bolsheviks and communists, who used wireless to perpetuate the pain and so deprive her of her reason. In this way the death of the stepmother, which occurred after the psychosis had developed, had no influence on the interpretation of the symptoms.

Such was the state of affairs when she was seen by us; she had been ill for a number of years, the psychosis was well developed, and she presented a very typical picture. Furthermore, as has been said, the development of the psychosis had taken place along typical lines. It presented a clinical type to be found in large numbers in any mental hospital. The characteristic features of such cases are depression with agitation, hypochondriacal features of all sorts, head sensations of the nature of pain or emptiness, and nihilistic ideas such as the absence of the brain or viscera. In addition, the illness was warranted by environmental and personality factors. There seemed no real grounds for regarding the case as anything but a very typical depression of involutional character.

The Physical Condition

Several points in the physical picture, however, aroused curiosity. The malfunction of the fifth nerves seemed to warrant special attention, especially as the head pains were, for the patient, of paramount importance. In fact, in spite of her delusions and the persecutory plot of which she felt herself a victim, she frequently stated that she could face the situation were it not for the pains. This statement differed in tone and reasonableness from almost all her other remarks. Also the head pains had been the starting-point of formal psychotic development. Furthermore, a developmental defect was present in the shape of a severe degree of cleft palate.

Interest in this was further stimulated by her behaviour on an occasion when, for no special reason, she experienced a cessation, so she said, of the pain. She was in bed when this occurred, and was found reading. She threw down the book, and with extreme animation expressed not unnatural joy at the relief. Opportunity was taken to talk with her for some time, and her conversation was rational. She also did not "rise" when led up to delusional topics. The next day she was as bad as ever.

Her mental state made it difficult to carry out an examination of the distribution of the fifth nerve with satisfactory accuracy, but after several examinations it seemed definite that there was loss of light touch and hypersensibility to painful stimuli in the territory of the supraorbital branch of the fifth nerve on each side. Thermal sense and localization seemed unaffected.

With this discovery two points seemed to appear in sharp relief. First, that it was the appearance of the pain and its paranoid interpretation which had induced a severe degree of mental derangement in the place of a recurrent depression of reactive type. It will be remembered that she had had a previous depressive attack from which she had recovered. Secondly, attention was drawn to her oft-repeated plea for morphine, and her statement that if the pain were away she could face the other difficulties. Her condition was such that the effect of sedatives could not be assessed accurately, but they did not appear to relieve the pain, as would be expected; moreover, analgesics seemed ineffective, which lent support to the functional and psychic nature of the pain. She was not told what medicine she was being given.

Reaction to Novocain

Some method was then sought with a view to putting the apparently involved section of the fifth nerve out of action. At the suggestion of one of us (N. M. D.) novocain 2 per cent. was injected around the right supraorbital notch. This abolished the pain for about an hour. The patient was much impressed, a feeling which we shared.

Then occurred an incident illustrating the difficulty of evaluation and also the degree to which this unfortunate woman had deteriorated rationally in her long illness. When the left side was being similarly tested some of the solution escaped into the lax tissues of the eyelid. Little or no anaesthesia was expected, and this was fulfilled. The patient declared that the injections were intended to destroy the remaining part of her brain, and refused to allow another attempt. This at once threw doubt on the whole procedure, and months elapsed without any further steps being taken, since the evidence was felt to be insufficient in view of the strong counter-evidence that the condition was psychological and "functional."

Finally, however, a favourable opportunity arrived, and one of us (N. M. D.) injected each supraorbital notch with novocain. This produced local analgesia and anaesthesia, and abolished the subjective pain. Operation was then decided upon.

Surgical Treatment

Anaesthesia was commenced with avertin administered rectally, following which the patient went to sleep soundly. After sleep had thus been quietly induced, gas and oxygen anaesthesia was instituted, so that the patient was brought to operation without any anxiety, and in fact without her knowledge. The supraorbital bony margins were exposed on each side by an incision in the line of the eyebrow, and immediately evidence was seen to support the growing belief in an organic lesion of the supraorbital nerves.

On both sides there was a bony bridge across the supraorbital notch, converting it into a foramen or canal. On each side this bony bridge was removed, opening up the canal and converting it into a notch similar to that of normal anatomy. The canal was about 7 or 8 mm. long on each side, and as the nerve was traced back it could be followed into the roof of the orbit, where anatomical conditions were again natural. These canals were very narrow, and there was quite obvious constriction of the nerves during their passage through them.

Resection of the nerves was decided on; they were severed distally, and the proximal part was drawn upon for the purpose of dissecting them as far back along the roof of the orbit as possible before severance. On both sides further confirmation of the abnormality of the nerves was given by the fact that, when thus pulled upon, the nerves broke at the point of compression in the narrow canals with undue ease. The proximal part of the nerve was seized again on each side, and each nerve was finally cut well back along the orbital roof.

Healing was uneventful, and no serious difficulty was encountered in the after-management of the wounds or the removal of the stitches. The patient was certainly

suspicious of any such surgical procedures. Histopathological examination confirmed the view that the nerves were abnormal, for extensive myelinic degeneration was found to be present. The patient was discharged to her own home convinced that her pains had gone and that the head noises were less severe, presumably due to lowered nervous tension generally. Unfortunately, before the progress of the case could be further observed, she developed influenza and died from bronchopneumonia.

Conclusion

This patient, then, suffering from what appeared to be a characteristic "functional" or "dynamic" variety of psychosis, typical both in development and in end-result, finally proved to have as the central symptom and major precipitating factor a disorder of a purely organic and remediable nature. Apart from the obvious queries as to the general level of integrity of the nerve structures in such a patient, loaded by a developmental failure of buccal structures, one finds this case history significant along general lines. It adds one item of information to the complex situation of "functional" and "organic" in nervous disease and to the problem generally of the very common cephalalgias met with in this field.

The case is one of depression developing as a reaction to an unhappy life situation. Paranoid features appear, due to the interpretation by the patient of a painful symptom. The weight of presumptive evidence suggests that the pain is "functional." Investigation puts this in some doubt. The pain is finally proved to be organic in origin. The question is posed as to what the progress of the case would have been if the painful symptom had been treated at its outset seven years before, and attention is drawn to the need for the recognition of the association of functional and organic features in psychotic and neurotic states.

AGRANULOCYTIC ANGINA

A CASE OF THE RELAPSING TYPE

BY

A. DALY BRISCOE, M.A., M.B., B.CHIR.

Morris, Miller, and Thacker Neville,[1] in reporting a case of agranulocytic angina recently, remark that "as the number of recorded cases in this country is still small, it is well that every accredited case should be reported with as full notes as possible on symptoms and treatment."

Amidopyrine and its allies have been thought to be causative agents in some cases, but in this case, as in my previous one,[2] it cannot be so. After the commencement of one of the attacks the patient was given four sedormid tablets, but as soon as the diagnosis was made these were stopped, and no drug of this character was taken before the final relapse. Apart from the problem of aetiology that of treatment has also been difficult, and the value of pentnucleotide, which was thought at first to be very great, is now being questioned.

My first case, that of a man of 71, recovered without having any pentnucleotide, and is still quite well now. In this present case it was thought that pentnucleotide had been responsible for the recovery in the December attack, but in view of subsequent events doubt must be cast on its value.

Case History

A woman aged 59 years had always enjoyed good health and had had three children, all alive and well. In April, 1934, she had what was apparently an attack of tonsillitis, which quickly subsided, and she was well again within a week. On November 15th, 1934, she again developed tonsillitis, with a temperature of 102° F., but was more ill than in April: the throat had the appearance of a follicular tonsillitis, and a throat swab was reported on as follows:

"No diphtheria bacilli present: cultures give a growth of *Streptococcus longus* which is non-haemolytic, and a yeast: the former produced 95 per cent. of the colonies and the latter 5 per cent."

The patient, when once over the initial stages, made a good recovery, and was about again after twelve days; then on December 17th, 1934, having been quite well up to the previous evening, she fell suddenly acutely ill with a sore throat and high temperature. This time the degree of toxaemia seemed much greater than before. The report on the throat swab was:

"Direct examination of this swab shows debris only; cultures, however, resulted in a mixed growth of the following organisms in about the stated proportions: haemolytic *Streptococcus longus*, 35 per cent.; non-haemolytic *Streptococcus longus*, 30 per cent.; *Streptococcus brevis*, 20 per cent.; *Staphylococcus albus*, 15 per cent.; no Klebs-Loeffler bacilli were cultured."

On December 21st her condition was definitely worse, and streptococcus (scarlatinal) antitoxin 10 c.cm. was given and a blood film taken; the report on this was: polymorphs, *nil*; lymphocytes, 92.4 per cent.; mononuclears, 7.6 per cent.; eosinophils, nil.

The diagnosis was now made and pentnucleotide 10 c.cm. was given twice daily. Gradually the exudate spread from the left tonsil all over the soft palate, and the right side was also involved. On December 21st and 22nd there were occasional erythematous patches of a blotchy character to be seen over the arms, and three days later these were seen on the abdomen. The pulse became intermittent at times and swallowing was difficult. A throat smear of December 22nd was reported on:

"Direct examination of this smear shows epithelial cells and various organisms, including many streptococci: no polymorphs were present."

There were signs of the huge slough that had formed separating on December 23rd, and on the following day the soft palate showed patches where the slough had come away.

The sloughs continued to separate, and on December 27th it looked as though a portion of the left tonsil had sloughed off, and the uvula appeared smaller and shrunken. Steady progress followed, but there was a slight reappearance of the exudate on January 1st, but by January 10th there was no sign of slough or exudate. During this illness the patient remained mentally alert. When drowsy she was perpetually groaning, but on being roused was at once normal and did not seem to realize that she had been making a noise. This behaviour was repeated in the subsequent attack.

The fever lasted nine days, and although clinically convalescence appeared to be uninterrupted, yet the blood counts did not improve as consistently as was desired. Three further injections of pentnucleotide were given and four of sodium nucleinate 2 c.cm., but neither had any pronounced effect on the blood counts. After February 19th no special treatment was given, and on March 15th the total white count reached 7,080, with 59.2 per cent. polymorphs: the various blood counts are appended below.

On July 22nd she went a journey of thirty miles to see her son; she began to feel unwell while having tea, and on arrival home that evening complained of a sore throat. Her temperature was already 102° F. and there was a slight exudate on the left tonsil; 20 c.cm. of pentnucleotide was given at once, and this was followed by vomiting. On the following day there was an exudate on both tonsils; vomiting occurred again

after the injection of pentnucleotide 10 c.cm. This amount was given twice daily, and when the patient was distressed coramine was injected. On July 24th there was again a blotchy eruption on the abdomen and lower part of the chest, and some exudate was seen on the posterior pharyngeal wall. The tongue and mouth were very dry and there was some diarrhoea. On the next day dysphagia was marked and the pulse became intermittent. On July 26th a small anal ulcer was seen. The throat sloughs were now very large, covering most of the fauces as before. On July 28th Cheyne-Stokes breathing was noticed when the patient was asleep. Much offensive sputum was coughed up, suggesting that sloughs were separating further down the pharynx and oesophagus. The report on the sputum was:

"Direct examination shows epithelial cells, no pus, many Gram-positive and Gram-negative cocci. Cultures resulted in growths of the following organisms, the approximate percentage of each being shown from a rough colony count: haemolytic *Streptococcus longus*, 10 per cent.; pneumococcus, 40 per cent.; *Micrococcus catarrhalis*, 50 per cent."

A second anal ulcer was observed on July 28th. By July 29th the patient was becoming increasingly weaker, the sclerotics appeared yellow, the sputum was foul-smelling and yellow in colour, and by 2 a.m. on July 30th she was semi-comatose; by 7 a.m. she was completely unconscious, and died at 1.30 p.m. The temperature rose to 106.6° F. before death.

Examination of a blood film on July 29th showed that:

"Many of the lymphocytes are larger than normal, with more cytoplasm, which stains more deeply than usual."

Immediately after death the patient became a vivid yellow colour, with purple patches beginning in the face and continuing down the limbs and all over the body.

Comment

In this patient for some reason the manufacture of polymorphs became irregular early in 1934, and the attacks in April and November must, in view of subsequent events, be regarded as due to a condition of mild agranulocytosis. The red cells appeared to be unaffected, and a count on December 24th revealed 4,650,000 red cells per cubic millimetre, with haemoglobin 74 per cent. Polymorphonuclear leucocytes were known to be absent for four days in the penultimate attack. The pentnucleotide treatment appeared to be responsible for the recovery in December, 1934, but in the illness of July, 1935, the patient never showed any response to it, the total white count continuing to fall till it reached the very low figure of 210 per cubic millimetre. Death in coma with hyperpyrexia also occurred in the case reported by Fairley and Scott.[3]

It would seem that this malady is more prevalent than is at present thought to be the case; it might therefore be wise in all cases of severe tonsillitis to examine the blood in order to exclude the possibility of agranulocytic angina.

Table of Blood Counts

	Percentage of Polymorphs in Differential Count	Total White Cell Counts
December 22nd, 1934	0.0	705
,, 24th, ,,	0.9	580
,, 26th, ,,	19.0	1,720
,, 30th, ,,	41.0	3,070
January 5th, 1935	44.1	3,715
,, 18th, ,,	19.4	2,030
,, 23rd, ,,	24.8	3,750
,, 28th, ,,	43.0	3,500
,, 30th, ,,	44.0	2,670
February 5th, ,,	36.0	4,120
,, 12th, ,,	42.0	3,850
,, 19th, ,,	50.5	3,500
March 15th, ,,	59.2	7,080
June 20th, ,,	44.5	3,060
July 22nd, ,,	0.7	2,200
,, 24th, ,,	0.0	930
,, 26th, ,,	0.0	560
,, 27th, ,,	0.9	270
,, 29th, ,,	0.9	210

My thanks are due to Dr. E. Biddle, *M.C.*, pathologist to the East Suffolk and Ipswich Hospital, for the great amount of trouble and care he took over the pathological investigations, and to my partner, Dr. E. F. R. Alford, *M.C.*, for his help.

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SOME EXPERIMENTS WITH PROTAMINE INSULINATE

BY

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AND

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One of the most obvious difficulties in the use of insulin in diabetes is its short-lived and often too violent action after injection. Thus in many severe diabetics a high fasting blood sugar (300 to 400 mg. per 100 c.cm.) may be rapidly reduced to normal, perhaps to hypoglycaemic levels, in three to five hours, but is maintained at this level for only an hour or two and, when the insulin action is over, rises to hyperglycaemic levels as quickly as it fell, with a return at the same time of glycosuria and ketonuria. Such patients run the risk of a dangerous alternation between clinical hypoglycaemia and hyperglycaemia with ketosis. Attempts have been made to slow and prolong the action of insulin, but the first important success has only recently been obtained by Dr. Hagedorn and his colleagues in Denmark. After two to three years of work they have discovered a compound of insulin and a protamine (protamine insulinate*) which by virtue of its low solubility in the tissue fluids is very slowly absorbed. One of us had the privilege of seeing the clinical results obtained by the Danish workers, and their experiences,[1] [2] with confirmatory results from America,[3] have just been published.

The advantages claimed are: (1) Its prolonged action, which can therefore keep the blood sugar normal for longer than ordinary insulin. It is stated to act "about twice as long," and a normal fasting blood sugar can therefore be obtained before breakfast. (2) A reduced liability to hypoglycaemia because of its slower and less violent action. The disadvantages pointed out in their publication are: (1) The instability of the protamine compound if kept for more than three to four weeks. (2) Its inability to control the hyperglycaemia which follows carbohydrate meals.

Hagedorn's present clinical practice is therefore to give insulin in the morning to deal with the day's carbohydrate food, and protamine insulin (P.I.) at night to keep the blood sugar in control until the next morning's dose. In our opinion some patients might find the use of two sorts of insulin very confusing.

By the courtesy of Dr. Hagedorn we have received a supply of protamine insulinate for experimental purposes, and have obtained complete confirmation of his results. We have extended our experiments to investigate in more detail its clinical action and possible uses and limitations. In all our investigations the blood-sugar estimations were controlled by simultaneous urine samples tested for sugar and ketones by qualitative methods. The latter, which are seldom published, were in every instance confirmatory.

* "P.I." will be used for the new insulin compound and "I." for the present form.

Length of Action

The duration of action of P.I. is vaguely stated to be "twice as long" as that of ordinary insulin. It is important to know more exactly how long it can act, with a view to the possibility of controlling diabetes by one injection a day. This was tested on two young severe diabetics who showed rapid oscillations of blood sugar after ordinary insulin. The criterion of the duration of P.I. action was the time during which it could prevent a rise in blood sugar from endogenous sources alone. Therefore no carbohydrate food was given during these experiments.

ILLUSTRATIVE CASES

Table I shows results in a girl of 11 with severe diabetes whose blood sugar was normal four hours after 30 to 40 units of I., but always rose to 300 to 500 mg. eight to ten hours after I. Different insulins and doses were given at 7 p.m. with 50 grams of carbohydrate, and no more food until the blood sugar rose. Thirty-six units of P.I. kept the blood sugar low, indeed at a slightly hypoglycaemic level for twenty-two hours, when a gradual rise of blood sugar with a simultaneous return of glycosuria and ketonuria terminated the experiment. A much smaller dose—16 to 12 units of P.I.—had variable effects, depending on the initial level at 7 p.m., but did seem to prevent the rise in blood sugar for about twelve hours.

TABLE I

Time	Hours After Injection	Mg. of Blood Sugar per 100 c.cm.				
7 p.m.	0	120	120	130	316	216
11 p.m.	4	50	111	—	308	208
8.30 a.m.	13½	352	51	148	325	221
10 a.m.	15		53		388	
2 p.m.	19		59			
3 p.m.	20		76			
4 p.m.	21		115			
5 p.m.	22		158			
Amount injected, 7 p.m.		32 units I.	36 units P.I.	16 units P.I.	16 units P.I.	12 units P.I.

TABLE II

Hours After 120 Units of P.I.	Blood	Urine		Food
	Mg. of Sugar per 100 c.cm.	Sugar	Ketones	
24	69	0	0	
27	114	0	0	P. & F.
29	118	0	0	
31	104	0	0	P. & F.
33	114	0	0	
35	101	0	0	
37	79	0	+	P. & F.
39	95	0	+ + +	
41	67	0	+ + +	
48	54	0	+ + + +	
51	68	0	+ + +	P. & F.
53	76	0	+ + +	
55	—	0	+ +	60 grams carbohydrate
55½	104	0	+	
57	279	+ + +	+	
59	200	+ + +	+	

P. & F. = Protein and fat meal.

In the second case there was a much longer action of P.I. after a large single dose of 120 units. The details of this experiment, showing interesting fluctuations in glycaemia and ketonuria, are given in Table II. This case, one of severe acute untreated diabetes in a girl of 22, was given an almost normal carbohydrate diet (250 grams) and one large dose—80, and then 120 units—of P.I. a day to see if one dose could control the diabetic condition. Within a week ketonuria was entirely abolished and she gained 6 lb. in weight. In the fasting condition and four to five hours after meals the blood sugar was normal—occasionally hypoglycaemic—but she had hyperglycaemia and glycosuria for one to three hours after carbohydrate meals, *a condition comparable to that of a mild diabetic patient treated without insulin*. P.I. (120 units) was given one morning, with 250 grams of carbohydrate during that day, and then no more insulin and only protein and fat food until the experiment ended—fifty-five hours after the dose of P.I.—by giving carbohydrate food. Details from the twenty-four to the fifty-eight hours (in Table II) show a complete control of glycaemia for fifty-five hours with slightly hypoglycaemic phases (no symptoms) and slight waves of higher blood sugar—which perhaps can be correlated with meals of protein and fat. Ketonuria recurred and persisted from the thirty-seventh hour; its significance will be discussed later.

It is thus clear that protamine insulinate can act not only twice as long as insulin, but even for more than two days.

Speed of Action of P.I.

If P.I. is absorbed more slowly and acts longer, the speed with which it exerts its action might be supposed to be slower than that of ordinary insulin. This was tested by a comparison of the effect of I. and P.I. on a high fasting blood sugar in Case I, the usual carbohydrate breakfast being withheld. Table III shows the fall of blood sugar and also the effect of giving ingested carbohydrate (50 grams of sugar) when insulin action was well established. In each case a similar breakfast of protein and fat (bacon and egg) was taken at hour 1 for the patient's comfort. The figures in brackets show the absolute fall and rise from hour to hour.

TABLE III.—*Effect of P.I. and I. on a High Fasting Blood Sugar*

Hours After Injection	Blood Sugar in mg. per 100 c.cm.		
0	340	385	438
1	250 (−90)	354 (−31)	387 (−51)
2	135 (−115)	270 (−84)	303 (−81)
3	57 (−78)	183 (−87)	201 (−102)
4	44 (−13)*	161 (−22)	163 (−38)
5	103 (+59)	150 (−11)*	126 (−37)*
6	138 (+35)	384 (+234)	346 (+220)
7	154 (+16)	350 (−34)	
8	180 (+26)	270 (−80)	
Amount Injected:	36 units of I.	36 units of P.I.	80 units of P.I.

* 50 grams of carbohydrate given.

It is clear that I. is quicker in its action, although the difference is not as great as we had expected, since the action of P.I. on endogenous sugar is effective and not much behind that of I. But even at the height of its action P.I. is incomparably the poorer in dealing with ingested sugar. The effect of doubling the dose of P.I. produced little if any more rapid fall of blood sugar. At the beginning of each experiment the patient was excreting large amounts of ketones. These were rapidly and completely removed in three hours by I., and more slowly and only partially by P.I.

Control of Ingested Carbohydrate by P.I.

The above experiments show that when P.I. is controlling or even reducing endogenous sugar it deals remarkably poorly with ingested carbohydrate and fails to prevent a relatively enormous increase in blood sugar. The Danish workers[1 2] have recognized this, and in cases in which they give P.I. at night have been forced to give I. before a carbohydrate breakfast to obtain that full control of hyperglycaemia and glycosuria which is their ideal. We have tried, without observing much difference, in several other experiments to see whether P.I. at different stages of its absorption—that is, half an hour or four hours after injection—can obtain better control over the uniform 50 grams of carbohydrate used. It is very poor in this respect compared with I. An experiment in Table IV shows this clearly with large doses of protamine in full action. It also shows a comparison of simultaneous arterial and venous blood-sugar values, which are agreed to be an index of sugar utilization by the tissues.

TABLE IV

Time	—	Blood Sugar in mg. per 100 c.cm.	
		Arterial	Venous
8.30 a.m.	32 P.I.	132	—
10.0 a.m.	50 grams carbohydrate	102	101
11.0 a.m.		296	264
noon		278	275
1.0 p.m.		183	178

After carbohydrate food in a normal person, or after injection of a large dose of insulin in a diabetic, the venous blood contains far less sugar than the arterial, and the arterio-venous difference should be as much as 20 to 80 mg. per 100 c.cm. We consider that the arterio-venous difference in this experiment is very slight, and reveals little evidence of peripheral activity of P.I. However, when large enough doses of protamine insulinate are given to maintain a very low blood sugar (40 to 60 mg. per 100 c.cm.) fairly liberal amounts of carbohydrate (50 grams a meal or 170 grams a day) have been well tolerated without a rise in blood sugar above 150 mg. and without production of glycosuria. We have been able to control Case I on a liberal amount of carbohydrate (170 grams) with two doses of P.I.: this patient had frequent bouts of glycosuria and persistent ketonuria with oscillating blood sugars on three doses a day of ordinary insulin.

The Occurrence of Hypoglycaemia

We have found, like other observers, that P.I. is much less likely than I. to cause hypoglycaemic *symptoms* at the same or even lower concentration of blood sugar, doubtless because the rapidity of the fall of blood sugar, as well as its absolute value, is an important factor. We have observed, however, one severe hypoglycaemic attack after P.I., while mild symptoms, at least, are apt to appear if big enough doses are given to attempt to control the hyperglycaemia and glycosuria which result from any reasonable carbohydrate meal. Such attacks occur many hours after carbohydrate meals, and are mostly to be expected between 3 and 6 a.m.

Clinical Conclusions

These clinical experiments amplify and confirm previous published experiences, and permit of the following conclusions.

1. Protamine insulinate acts more slowly and for a much longer period than ordinary insulin, and a large dose can act for more than two days.

2. It is much weaker in dealing with carbohydrate food and usually cannot prevent hyperglycaemia after meals. In contrast, its action on endogenous sugar is nearly as rapid and good as ordinary insulin.

3. It causes less symptoms of hypoglycaemia than ordinary insulin, even at the same blood-sugar concentration. Protamine insulinate is certainly absorbed more slowly from the subcutaneous tissues. It therefore has qualities which promise great use in severe diabetics with oscillating blood sugars and rapidly recurrent ketosis. On the other hand, it is not strong enough in its action to control ingested carbohydrate, so that the use of ordinary insulin before carbohydrate meals and protamine insulinate in the evening has been advocated and is necessary to obtain full control of the diabetic condition.

Another insulin preparation combining the qualities of ordinary and protamine insulinate would obviously be more useful than either, and it is not too much to hope that the Danish or other experimenters may soon obtain this. In the meantime, it must be stated that protamine insulinate, great though its advantage may be in some cases, is not generally obtainable for clinical use in this country, and is indeed still in the experimental stage.

A DISCUSSION OF INSULIN ACTION

BY

R. D. LAWRENCE

Deductions from Experiments with P.I.

From the above experiments with protamine insulinate we can distinguish two different phases of insulin action in the severe diabetic. A low concentration of insulin in the tissues, such as P.I. gives, is able to control hyperglycaemia from endogenous sources for long periods, but is quite incapable of coping with ingested carbohydrate as the higher concentrations of ordinary insulin do. I conclude that in normal carbohydrate metabolism a continuous small secretion from the pancreas (or perhaps merely a small residue from the last active secretion) controls the blood sugar continuously, but that a large extra secretion must be produced by the pancreas by the stimulus of ingested carbohydrate to deal with this successfully. Such an increased secretion of insulin in response to a rising blood sugar is a point of view which has been suggested before, but it has never been satisfactorily proved. Indeed, several experiments, especially recent ones by Soskin on depancreatized dogs, cast serious doubt on it.

Another most interesting observation, shown in detail in Table II, is the return of a heavy ketonuria from the thirty-seventh hour after P.I., at a time when the glycaemia was still completely controlled. During this time the patient was not in a typical diabetic condition, and the ketosis is comparable to that which ensues from carbohydrate starvation in normal individuals and is supposed to coincide with the exhaustion of liver glycogen. Whether her ketosis (occurring twenty-six hours after the last carbohydrate meal) coincided with glycogen depletion or was partly due to the protein and fat meals we cannot know for certain, but it did not develop until ten hours after the first protein and fat meal. This type of starvation ketosis is generally agreed to result from the accumulating by-products of protein and probably fat katabolism during the process of neoglucogenesis in the liver.

In a normal starved person the injection of insulin alone does not remove the ketosis (Goldblatt), but carbohydrate food rapidly does. In the severe diabetic investigated with ordinary " short-action " insulin hyperglycaemia and ketosis disappear and recur almost simultaneously, and it is difficult to define and study the two conditions separately. But protamine insulinate has revealed a condition in which ketogenesis is not checked, presumably because neoglucogenesis is proceeding as in starvation, and yet the new sugar does not cause hyperglycaemia. I would conclude that the small concentration of P.I. fixes the new sugar, probably as glycogen, but does not stop the new production.

Diabetes and Insulin Action

I am tempted, in the light of the above observations, to try to discuss the complicated problem of how insulin acts and what pancreatic diabetes is. Severe diabetes has presented two main aspects to most observers: (1) the failure to *utilize* (store and/or burn) carbohydrate ; and (2) the *over-production* of new sugar and ketones even in starvation.

Whether the second aspect is a primary defect or merely secondary to the first has been variously debated. Insulin rectifies both defects for a time, but it has been argued whether it checks the over-productive neoglucogenic process directly or merely makes the latter unnecessary by providing sufficient utilizable carbohydrate. I have always inclined to the latter view, as it is unlikely that a definite chemical substance such as insulin does more than one thing. I suggest that the only action of insulin is to turn *glucose into glycogen* in both liver and muscles.

Since the days of Claude Bernard the main interest in diabetes has always centred not only on the sugar in the blood but also on the glycogen in the tissues. A few clear facts emerge from thousands of experiments. It is certain that the diabetic liver contains practically no glycogen, and that muscle glycogen is diminished. Insulin and sugar make these normal in the diabetic dog, but in normal animals contradictory effects have been observed. It is generally agreed that in the skeletal* muscles insulin always increases glycogen until the convulsive stage, in which it is reduced, as might be expected, by the violent contractions. In the liver, however, insulin has been shown to have varying effects, depending on the previous nutrition, the species and age, and the duration of its action. In most experiments glycogen is reduced, but is sometimes unchanged and occasionally increased. If insulin merely turns glucose into glycogen we would expect no increase in the liver unless much sugar were present for it to act on ; and as insulin seems to favour the muscles in its deposition of glycogen from sugar, we might expect it to deplete the liver, especially after a few hours' action, which has been found to happen.

The Supply of Blood Sugar

New sugar for the body's needs comes from two sources: (1) ingested carbohydrate ; and (2) new production from the intermediate metabolism of protein and, probably, of fat.

1. The absorbed sugar from ingested carbohydrate is turned into glycogen by insulin, whose function I consider this to be. It has always seemed significant to me that the islets of Langerhans are buried in the largest digestive gland in the body. The rising blood sugar after food stimulates an increased production of insulin, which stores the excess sugar as glycogen primarily in the muscles and also in the liver when large enough amounts of sugar are available. There is also a small secretion between meals, to keep the blood sugar normal all the time. There is so little secretion in severe diabetics that hyperglycaemia is present even in starvation. However, injections of protamine insulinate can supply for long periods sufficient insulin to control hyperglycaemia except after meals. The mild diabetic lives in a similar condition, and has sufficient endogenous insulin to prevent hyperglycaemia except after much carbohydrate food.

2. When no carbohydrate food is available, or during complete starvation, the blood sugar does not fall very appreciably below the fasting level, and can be maintained for weeks in the absence of food, obviously by the production of new sugar from endogenous sources. This new sugar can be produced only from protein and fat,* and the production is always accompanied by the onset of ketosis, which I look upon as a sure indication that transformation of protein and fat to new sugar is in progress. It seems certain that the liver is essential for this transformation, because in hepatectomized dogs the blood sugar falls to a fatal low level and ketosis never develops. In the normal starved individual neoglucogenesis produces ketonaemia but not hyperglycaemia, because the new sugar is stored as glycogen by insulin. But in the severe diabetic, unable to store glucose as glycogen, neoglucogenesis produces both ketonaemia and hyperglycaemia, and the latter may be so marked that the new sugar production has been mistaken for the primary defect in diabetes—the " over-production " theory. However, we have seen from the protamine insulinate experiment that the presence of a small concentration of insulin in a severe diabetic can entirely control hyperglycaemia without stopping ketosis and neoglucogenesis, which proceed exactly as in a normal starved person. Neoglucogenesis is directly dependent neither on insulin nor on appreciable changes in the blood-sugar level, but, I suggest, on the concentration of liver glycogen.

The Adrenal, Thyroid, and Pituitary Glands

The action of these three endocrine glands and their extracts must also be considered in the regulation of blood sugar and in the diabetic picture. In excess, both when administered experimentally and in human disease, these glands are antagonists to the hypoglycaemic action of insulin, and all have recognized effects on liver glycogen. In the normal animal adrenaline mobilizes liver glycogen into blood glucose within an hour ; thyroxine entirely prevents the deposition of liver glycogen, however much carbohydrate is taken ; and anterior pituitary extracts make liver glycogen very labile and unstable, whereby the hyperglycaemia after adrenaline is increased and the hypoglycaemia after insulin is diminished. Indeed, injections of pituitary extracts can produce in the experimental animal a condition of glycosuria and ketonuria very like pancreatic diabetes. On the other hand, removal of the pituitary produces great sensitivity to insulin injections and sometimes a fatal spontaneous hypoglycaemia comparable with the effects of hepatectomy. Also, in the absence of the pituitary, diabetes does not develop in dogs when the pancreas is excised. The removal of the suprarenal has similar effects.

It would appear that the above three glands, whatever their exact individual share may be, play an important part in the supply of blood sugar. In excess they facilitate the supply of peripheral sugar by preventing the deposition of liver glycogen, and, when they are defective, the resultant hypoglycaemia may be caused by the undue stability of liver glycogen. It may also be that, apart from their effect on liver glycogen, these glands directly stimulate the katabolism of protein and fat involved in the neoglucogenic process, perhaps by reflex overactivity, when new sugar is necessary. This would be a useful function—but this is mostly surmise, although there is

* It appears that the glycogen of the heart and unstriped muscle behaves quite differently in diabetes and after insulin, and is not included here.

* The latter is still disputed by some physiologists.

some evidence for it. For instance, the pituitary is known to affect protein and fat metabolism, and the adrenal is certainly hypertrophied in starvation. If they do become overactive some curious clinical observations mentioned below find an explanation.

On the clinical side the condition of "resistance" to insulin in diabetics with Graves's disease is explained by the action of thyroid on liver glycogen. I would also suggest that the "diabetic" blood-sugar curves observed in normal people after carbohydrate starvation, and the reduced action of insulin in normal people and in diabetics on low carbohydrate diets (the insulin "insensitivity" so neatly demonstrated by Himsworth), may be due not to the absence of an "insulin-kinase," but to the prevention of glycogen deposition associated with the neoglucogenic process and probably dependent on overactivity of the adrenal, thyroid, or pituitary. Again, the puzzling fact that low-carbohydrate high-fat, and high-carbohydrate low-fat equicaloric diets require much the same dose of insulin in severe diabetics can also be explained. On low carbohydrate diets the body has insufficient sugar supplied and new sugar production takes place, requiring insulin for its control. Clinically the action of insulin is strikingly quantitative, and I think it likely that one unit of insulin is required to turn an equal amount of glucose into glycogen, whether the former is exogenous or endogenous in origin.

The Liver and Its Glycogenic Function

The theory presented in this paper requires the hypothesis of an automatic mechanism in the liver, dependent on a critical concentration of liver glycogen, as regulating blood sugar and, especially, new sugar production. I would postulate a glucose-glycogen equilibrium, as inherent as the heart-beat, though probably affected, as the latter is, by sympathetic and parasympathetic influences.

The mechanism of pancreatic insulin to deal with ingested sugar by turning it into muscle and liver glycogen is easy to understand. After sufficient carbohydrate food endogenous sugar production is stopped and the respiratory quotient approaches unity. As sugar is burned in the tissues liver glycogen is paid out as glucose to maintain an adequate blood sugar for peripheral needs, and a low critical concentration of liver glycogen is reached which calls for new sugar production and initiates the neoglucogenic process. A low respiratory quotient and ketosis are signs of this. Insulin *per se* does not inhibit the process, but is necessary for the new sugar to be turned into liver glycogen. In the absence of insulin to re-form a critical concentration of liver glycogen the neoglucogenic process runs riot, hyperglycaemia persists, and, more serious still, the diabetic is threatened by severe ketosis from the by-products. I think that the time-honoured phrase "the glycogenic function of the liver" is confusing, and suggests one process where two should be distinguished: *first, the synthesis by the liver of new glucose from protein and fat, from circulating lactic acid, etc., and, secondly, the formation of liver glycogen from this sugar by the action of insulin.*

This theory, outlined in main principle only, fits in with most of the definite experimental findings, and certainly with the clinical manifestations of diabetes and insulin action, with which I am more familiar. It gives me a clear point of view (at least temporarily!) in the approach to clinical problems, and I therefore make no apologies to the physiologists for incursions into their sphere.

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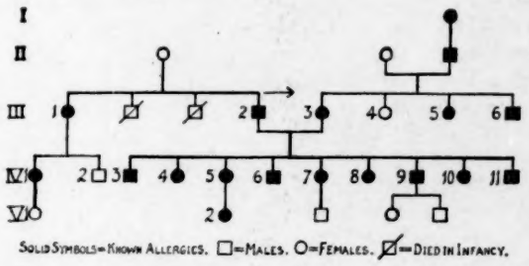
Clinical Memoranda

Allergy in Five Generations

Most authorities are agreed that heredity plays an important part in the aetiology of the various allergic diseases and of asthma in particular, and the following pedigree, which traces these conditions through five generations, appears to be of importance in confirming this view and in demonstrating how different forms of allergy are found in different members of an affected stock.

I have had the opportunity over a period of years of observing this family group, in which allergic conditions occurred in both ancestral lines, and the underlying sensitiveness or metabolic error appears in each of nine brothers and sisters (fourth generation) in different forms and degrees, many showing several varieties of the dyscrasia. Three members of this group (a mother and two daughters) have rheumatoid arthritis in addition to other allergic manifestations. This is a condition sufficiently uncommon to make such a distribution remarkable, and it supports the theory of the allergic nature of this disease. It is too early to know how the fifth generation will be affected; most of them are still children, and one is known to be asthmatic. Although Bray states in *Recent Advances in Allergy* that where there is allergic inheritance symptoms tend to appear early (before 6 years of age if inheritance is bilateral, before 8 if unilateral), yet some members of this family did not show signs of allergy until the age of 35 or 40.



Generation I: Asthma.
Generation II: Hay fever.
Generation III:
1. Asthma.
2. Food allergy.
3. Asthma, hay fever, rheumatoid arthritis.
4. Died aged about 14 years (no allergy known).
5. Migraine.
6. Food allergy.

Generation IV:
1. Asthma.
2. No allergy known.
3. Migraine and hay fever.
4. Hay fever, train sickness.
5. Asthma, hay fever, rheumatoid arthritis.
6. Vasomotor rhinorrhoea.
7. Migraine, train sickness, food allergy.
8. Food allergy, urticaria, rheumatoid arthritis.
9. Asthma (first attack about 40 years of age).
10. Migraine, asthma, vasomotor rhinorrhoea.
11. Hay fever, food allergy.

Generation V: 2. Asthma, vasomotor rhinorrhoea, car sickness.

Such allergy as is shown here may be understood to imply a chemical dyscrasia of metabolism, probably of the nature of an inefficiency in the breaking down of certain proteins causing a condition the opposite of assimilation (or the opposite of immunity, as another writer has expressed it), leading to lesions which are essentially similar in the different organs attacked—that is, a vasomotor disturbance, with capillary dilatation and increased permeability of the vessels, transudation into the surrounding tissues, and exudation. Thus in asthma the bronchioles are affected, in hay fever the nasal mucosa, in migraine the meninges or ependyma, in urticaria the skin, and in rheumatoid arthritis the muscles, bones, and joints.

Individual members of this family group have suffered from different allergic diseases at various stages of their lives; they have outgrown or recovered from one allergic state, and have subsequently developed another; and several have suffered from, or been liable to, two or more allergic conditions at the same time. The following are instances of this.

Generation III: 3. Suffers from asthmatic attacks, and at the same time has chronic rheumatoid arthritis in by no means a quiescent stage.

Generation IV: 5. Suffered from asthma in childhood, from spasmodic rhinorrhoea and hay fever throughout adult life, and at the age of 42 developed rheumatoid arthritis.

Generation IV: 7. Suffers from migraine, food allergy, and train sickness whenever the particular exciting conditions exist.

Generation IV: 10. Had attacks of migraine in her third decade, and vasomotor rhinorrhoea and asthma when about 35 years old.

Generation V: 2. Had asthma in infancy, and is liable to hay fever and to car sickness.

I have observed this doubling and trebling of allergic disease in other patients not related to this group, and it seems that a constitutional tendency to metabolic error remains permanent throughout life, though the particular manifestation—asthma, urticaria, or migraine, as the case may be—can be relieved or controlled by suitable therapeutic measures. Apart also from treatment, changes in external or internal environment (such as are brought about by puberty, advancing age, etc.) may be sufficient to start or to end any particular allergic disease. The reason for the heavier incidence of certain forms of allergy on one sex or at one period of life has yet to be explained. It is probable that a second biochemical factor is required before the allergic condition develops.

It is of interest to note that in this family group the liver appears to be more than ordinarily vulnerable: six out of thirteen of the fourth generation have suffered at one time or another from jaundice or gall-stones, or both. Is it not possible that some of these allergic symptoms may be caused by imperfect liver function allowing unreduced foreign substances to reach the blood stream, and so to bring about local manifestations of the allergic condition wherever there is a *locus minoris resistantiae*—bronchioles in one case, skin or joints in another? In this connexion it may be observed that many of the exciting causes of allergic attacks, such as chill, emotion, or unsuitable food, can also cause disturbance of liver function.

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Vitamins for Habitual Abortion

During the past few years the importance of the vitamins in the maintenance of the growing embryo has been demonstrated. Especial significance has been given to the action of vitamin E. It is inconceivable that in the general diet of to-day there could be a complete absence of any one of the vitamins, yet it is possible that during pregnancy, when metabolism undergoes such drastic changes, more vitamins are necessary and a relative deficiency in one or all of them may lead to such morbid conditions as habitual abortion, albuminuria, etc.

Experiments with animals have shown that the presence of vitamin E is essential for the continuation of a pregnancy to a successful issue. Vitamin E is found at a fairly high concentration in the oil obtained from the germ or embryo of whole grain.

P. Vogt-Möller of Copenhagen[1] has collected twenty cases of habitual abortion treated by the administration of wheat-germ oil. The results obtained were favourable: seventeen of the twenty women gave birth to living children at full term. Habitual abortion is not an uncommon condition, but some months must elapse before a sufficient number of cases can be collected to make a fair estimate of the results of treatment. During the past two years, through the courtesy of Glaxo Laboratories, we have been given an unlimited supply of wheat-germ oil. An extract of the oil is supplied in three-minim capsules, and the dose consists of one capsule daily, taken by the mouth, from the day of the first attendance until the onset of labour. At first only vitamin E (that is, wheat-germ oil) was given, but later vitamins A and D were added. (Adexolin, or calcium gluconate and calciferol, one tablet daily.)

In the following series each case was tested for the presence of a general disease, uterine displacement, or torn cervix. Twenty-nine cases have been treated, and of these twenty-three have been delivered and the other six are all past the sixth month of pregnancy. The average length of time that the treatment has lasted has been five months. Twenty-two living children have been delivered; one of these died from a structural deformity of the throat. There was only one case of abortion. The twenty-three delivered mothers had had, collectively, seventy-three previous pregnancies resulting in the birth of only eleven living children, five of which died immediately after birth.

Table of Cases Treated with Vitamins

Case No.	Age	No. of Pregnancies	Details of Pregnancies	Result in Pregnancy Treated with Vitamins	Complication
1	28	4	1, alive; 2, 4/12; 3, 3/12	N.F.T., living	—
2	25	2	1, 3/12 (albuminuria)	,, ,,	Albuminuria
3	34	4	1, S.B.; 2, 7/12; 3, 6/12	Normal, 35 weeks	—
4	24	3	1, anencephaly; 2, 3/12	N.F.T., living	—
5	23	5	1, 6/12; 2, 3/12; 3, died; 4, S.B., 8/12 (macerated)	F.T., living (Caesarean)	—
6	25	4	1, 6/12; 2, 7/12; 3, 6/12	N.F.T., living	—
7	26	3	1, 7/12; 2, S.B. (alb.)	,, ,,	—
8	32	4	1, 4/12; 2, 4/12; 3, S.B. (term)	Normal, 35 weeks	—
9	36	5	1, 5/12; 2, 3, 4, 7/12	,, 34 ,,	—
10	23	2	1, 7/12	N.F.T., living	—
11	29	6	1, 2, abortions; 3, alive; 4, 5, abortions	Aborted	—
12	30	5	1, died (alb.); 2, alive; 3, 3/12; 4, died (alb.)	N.F.T., living	Albuminuria
13	27	4	1, 3/12; 2, 3/12; 3, 4/12	F.T., living (Caesarean)	Albuminuria, scarred cervix
14	30	3	1, 7/12; 2, 8/12, S.B.	N.F.T., living	—
15	33	4	1, 8/12, S.B.; 2, 3/12; 3, 4/12	,, ,,	—
16	34	6	1, 8/12, S.B.; 2, 2/12; 3, 8/12, S.B.; 4, 4/12; 5, N.F.T.	N.F.T., died	Throat deformity
17	31	3	1, A.P.H.; 2, 4/12	N.F.T., living	Icterus gravis (blood trans.)
18	26	3	1, A.P.H.; 2, 2/12	,, ,,	—
19	29	3	1, S.B.; 2, 5/12	,, ,,	—
20	30	6	1, died; 2, N.F.T.; 3, 6/12; 4, 6/12; 5, 7/12	,, ,,	—
21	38	6	5 abortions, 2-4 months	Normal, 34 weeks	—
22	33	6	1-2, 7/12; 3-5, 8/12, S.B.	N.F.T., living	—
23	36	5	1, craniotomy; 2-4, 3/12	F.T., living (Caesarean)	—

N.F.T. = Normal full-time delivery.
S.B. = Stillbirth.
2, 4/12 = Second pregnancy aborted at fourth month.
A.P.H. = Accidental haemorrhage.

By permission of Rhoda H. B. Adamson, M.D., F.C.O.G., honorary surgeon to the Leeds Maternity Hospital.

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[1] *Acta Obstet. et Gynecol. Scandinavica, Helsingfors,* 1933.

British Medical Association

CLINICAL AND SCIENTIFIC PROCEEDINGS

ROCHDALE DIVISION

The Female Sex Hormones

At a meeting of the Rochdale Division on February 14th, with Dr. J. C. JEFFERSON in the chair, Dr. J. W. A. HUNTER (Manchester) gave a lecture on the female sex hormones, which was illustrated by lantern slides and diagrams. The following is an abstract of the lecture.

Dr. Hunter remarked that only in recent years had the reproductory hormones been isolated and the interaction between all the glands been demonstrated satisfactorily. Twenty years elapsed between the discovery, in 1903, that the corpus luteum controlled implantation of the ovum and the isolation by Doisy, in 1923, of "theelin," or oestrin, which promoted the growth of the endometrium and vaginal mucosa, as well as stimulated uterine contractions. Aschheim and Zondek, in 1928, found that the urine of pregnant women contained large quantities of a potent pituitary hormone (prolan), which would induce oestrus in rats. It was thus made clear that the ovarian follicle in ovulation produced oestrin, which acted on the uterine endometrium and brought about the interval condition of the menstrual cycle; that the corpus luteum secretion controlled pregnancy and produced the pre-gestational or pre-menstrual phase in the endometrium; and that both these secretions were dependent for their production on prolan secreted by the anterior lobe of the pituitary body, which also caused the formation of the ripening follicles and ovulation, and the subsequent formation of the corpus luteum.

Further research had shown that no matter how much folliculin (oestrin) was injected into a monkey the endometrium would not hypertrophy beyond the interval phase, but that if progestin, the corpus luteum hormone, was also given the endometrial growth progressed to the pre-menstrual or pre-gestative phase. Continued administration of these hormones did not produce menstrual flow, but another observation proved that the sudden removal of these hormones precipitated it, and the hypertrophied endometrium was cast off in the phenomenon of menstruation. Should pregnancy supervene, however, the pre-gestational phase of the endometrium formed the decidua for reception of the ovum, and menstruation did not occur. The corpus luteum hypertrophied enormously in order to produce sufficient progestin to maintain the growing decidua, and persisted for this purpose throughout pregnancy. An inadequate supply of corpus luteum was a common cause of repeated abortion. Prolan was responsible for the production by the corpus luteum of progestin and relaxin, the former acting only as a complement to oestrin and causing pregestational endometrial hypertrophy. Relaxin had been found to have a quieting effect on uterine contractions, and to relax the symphysis in some of the lower animals. It was possible that it was produced in large amounts by the corpus luteum of pregnancy in order to lessen uterine contractions and to relax the ligaments and joints of the birth canal in preparation for labour.

During the past two years, Dr. Hunter continued, most of these hormones had been prepared synthetically or recovered in large quantity from pregnancy urine. In 1933 Schwenk and Hildebrand had prepared a dihydrofollicular hormone with a potency one hundred times that of the normal ovarian follicular hormone, and this had proved very useful therapeutically; but progestin was still most expensive to produce, and its therapeutic employment consequently difficult. Zondek had found quite recently that the prolonged administration of ovarian follicular hormone to immature rats caused stunted growth and atrophy of the ovaries, with failure in the production of corpora lutea. The explanation seemed to be that excess of this hormone paralysed the gonadotropic hormones of the anterior pituitary body, thus hindering them from acting on the ovaries. In male rats there was complete atrophy of the testes or failure of these organs to develop. There was considerable evidence that prolonged overdosage with oestrin brought about sclerosis of the ovaries and subsequent amenorrhoea.

Ovarian Hormones in Therapy

Dr. Hunter then proceeded to discuss the clinical application of these discoveries. Kaufmann of Berlin had been able in 1933 to convert the atrophic endometrium of a castrated woman into a functionally active state, and later, by supplementing the follicular hormone used with corpus luteum hormone, to produce the premenstrual state and a subsequent menstrual flow. It had been found that at least a million units had to be injected intramuscularly, and since only 1/30 of an oral dose was effective it was clear why the oral administration of this hormone in the past had proved quite inadequate. In primary amenorrhoea it was often possible to enable the uterus to grow to normal size with subsequent menstruation by giving one to two million units intramuscularly of the follicular and corpus luteum hormones. Bleeding might be produced by follicular hormone alone, but this was merely diapedesis of blood from an interval mucosa and not true menstruation. Dr. Hunter had treated two cases successfully according to Kaufmann's method, but so far there had been no permanent restoration of menstrual function.

In secondary amenorrhoea all general causes must first be excluded, after which menstruation could in most cases be restored by the complete course of injections or by follicular hormone alone. Sometimes the restoration appeared to be permanent. In oligomenorrhoea, or scanty menstruation with symptoms of ovarian deficiency, much benefit was often derived from one or two courses of follicular hormone: the scanty menstrual flow returned to normal, the menopausal symptoms disappeared, and the patient felt better generally. If there was associated sterility pregnancy might ensue. The injections should be given in the first half of the intermenstrual period —namely, during the proliferative phase. In cases with very severe menopausal symptoms complete relief might be obtained by weekly doses of 500,000 units of the follicular hormone, but in milder cases much smaller doses might suffice.

Kraurosis vulvae with associated pruritus often improved after a course of injections with follicular hormone when all other treatment had failed to give benefit. A dose of one to two million units of dimenformon might be necessary to give relief, but thereafter the dose could be reduced. Acne rosacea could be similarly treated. In cases of habitual abortion due to deficiency in corpus luteum secretion a daily injection of corpus luteum during the first three or four months, with the usual precautionary routine in cases of threatened abortion, would often prove successful, but the treatment was very expensive. In adolescent and menopausal menorrhagia the underlying factors were excessive production of follicular hormone with deficiency of the corpus luteum hormone, the result being failure to convert the proliferated endometrium (cystic hyperplasia) into the secretory phase with casting off of the endometrium. In the first instance corpus luteum injections would often produce an immediate cessation of the bleeding, and less frequently the same result might be obtained in cases of menopausal bleeding. If a large persistent follicle was present, hormone treatment was quite inadequate. Dr. Hunter had not found the exhibition of the follicular hormone of benefit in spasmodic dysmenorrhoea, but he thought that it might be worth while to try an intramuscular injection of 50,000 units of dimenformon before the onset of a period. He concluded his address with a reference to the possible relation between cancer and the sex hormones. Patients with malignant disease sometimes showed a definite increase in the amount of blood oestrin. All sex-hormone therapy should be approached, therefore, in an attitude of caution.

Reviews

TREATMENT IN GENERAL PRACTICE

Readers of the *British Medical Journal* have no doubt read with appreciation the series of special articles on treatment which have been appearing in it regularly for more than a year. A number of these have now been collected into the first volume of *Treatment in General Practice*,[1] and other volumes are promised later. The present collection deals with diseases of the respiratory system, acute specific fevers, and cardio-vascular diseases. No attempt has been made to include every disease or disorder which falls into these categories, but it may fairly be claimed that most serious conditions likely to be met in ordinary practice have been considered, although the omission of pulmonary tuberculosis must be noted. The contributors are all experts in their own subjects, and we are told in the preface that the Editor's instructions to them were to be practical, concise, and even dogmatic. It is easier, as the present writer knows only too well, to give such instructions than to get them obeyed, but in this instance they have been followed to admiration. The result is that the articles are so uniform in their mode of presentment that they might all have been the work of one author, whilst the therapeutic instructions given in them are clear and definite, and the reader is not confused, as he so often is in books on treatment, by the mention of lists of remedies which are "sometimes successful." It is, as is pointed out in the preface, very difficult to exclude diagnostic questions altogether when dealing with treatment, but in the main the discussion of diagnosis in these articles has been reduced to a minimum. In spite, however, of the Editor's deprecation of criticism in this respect, it is a little difficult to see what Dr. Hope Gosse's contribution on "The Electrocardiogram in Prognosis and Diagnosis," excellent though it is in its own way, is doing in this particular *galère*, for there is not a word about treatment in it.

The book is one which can be cordially commended both for its matter and for its form, and it deserves a place among that small and select company of volumes which are to the harassed practitioner a very present help in time of trouble. The succeeding volumes of the series will be awaited with impatience.

ROBERT HUTCHISON.

AN INTRODUCTION TO PHYSIOLOGY

The student of medicine at a German university knows that he will have little chance of passing an examination in any subject if he has not read and carefully studied the latest book written thereon by his professor. He knows that this is the book "to be used" and that it is here that he will find the answers to the questions his examiner (usually identical with his teacher) will put before him.

It is with this background in view that books like Professor REIN'S "Introduction to Human Physiology" must be read and their utility be estimated. The author states in his preface that it is his aim to fight "the boredom and the lack of interest so common now among students, and caused by the mechanical memorizing of unintelligible technical terms found in compendiums and cram books." It remains an open question whether the crammers can be called the "cause" for the student's negative attitude. Ennui and crammers might both be attributable to a common cause lying in the method of teaching. In any case the student should not be deluded by the author's proclaimed programme into assuming that his "Introduction" is an easy book to read, or that it might be a guide for the beginner. Neither is the case. Much knowledge must have been acquired by the student before he can hope to derive the full benefit from Rein's book. The style is heavy and the amount of knowledge, compressed into comparatively little space, overwhelming. Even so, the book is far from being an introduction into the whole field of physiology. Apart from a rather short chapter on "internal secretions" it does not contain a word on the physiology of the organs of reproduction. All the other systems of the body, however, are dealt with. The book is well printed, and numerous good illustrations are inserted into the text. For the interested and ambitious student who wants to know more for his examinations than is "absolutely necessary," Rein's introduction will make good reading.

BLOOD PRESSURE AND NEPHRITIS

The rapid issue of new books dealing with blood pressure and allied problems is an index of the claim which these subjects are making on the attention of the medical profession. The latest of the series is *Variations in Blood Pressure and Nephritis*,[3] by Professor HERMAN O. MOSENTHAL. It is a very attractive volume, and it includes a statement of the author's personal experience and teaching, and also a critical examination of the views of other authorities; the bibliographical references cover an unusually wide range. Among the more recent developments in the study of blood pressure two may be noted. One of these is the recording sphygmomanometer, which inscribes a written record independent of the observer's stethoscope or palpating finger, and is claimed to be more accurate than the auscultatory method. A second advance is the blood ptosis test (Crampton index), which is based on the differences (taken under due precautions) between the systolic blood pressures and heart rates in the standing and recumbent positions respectively, and which is credited with large service both in diagnosis and in therapeutics. We mention these two topics at the outset as they are very fully discussed by Dr. Mosenthal, and may be accepted as evidences of the completeness which distinguishes his survey. Both in its doctrinal and in its clinical aspects blood pressure, whether excessive or defective, is very fully considered in appropriate chapters; an attempt is made to establish different groups of high blood pressures; and very clearly stated is the view that "essential hypertension" (Clifford Allbutt's "hyperpiesia") is not the result of arteriosclerosis, but that, on the contrary, all the pathological changes related to it are secondary results of the increased blood pressure.

The second part of the book is occupied by a very interesting and practical discussion of nephritis, or, as the author prefers to call it, Bright's disease. The choice of this second name is made deliberately and for the purpose of emphasizing the view that non-suppurative disease of the kidney (nephritis) is not a mere local disease, leading, through retention of excretory products, to such secondary symptoms as oedema, uraemia, and hypertension. To think of Bright's disease as nephritis, writes Dr. Mosenthal, "is comparable to thinking of typhoid fever as enteritis." The opposing view as here presented is that Bright's disease includes six factors—namely, renal

[1] *Treatment in General Practice: The Management of Some Major Medical Disorders.* Articles republished from the *British Medical Journal*. London: H. K. Lewis and Co., Ltd. 1936. (Pp. 248. 8s. 6d. net.)

[2] *Einführung in die Physiologie des Menschen.* By Professor Dr. Hermann Rein. Berlin: J. Springer. 1936. (Pp. 464; 366 figures. RM. 18; geb., RM. 19.60.)

[3] *The Diagnosis and Treatment of Variations in Blood Pressure and Nephritis.* By Herman O. Mosenthal, M.D. New York and London: H. Milford, Oxford University Press. 1936. (Pp. 616. 42s. net.)

pathological changes, renal function, oedema, anaemia, blood pressure, and uraemia, and that these occur, develop, and recede with a certain degree of independence of one another. This definition, it is urged, is not only true to nature but, in addition, it favours both accurate diagnosis and appropriate treatment. It carries also a note of historical interest, for it reads very like the original teaching of Dr. Richard Bright on albuminuria and dropsy and kidney disease. There is a story that at a medical meeting Dr. Bright was once shown two apparently very different pathological kidneys and was challenged to say which was his "disease," and his reply was "I will take both of them!" Dr. Mosenthal has certainly given us a very interesting and very valuable clinical and pathological study.

RADIOGRAPHY OF THE CHEST

The book entitled *Apparatus and Technique for Roentgenography of the Chest*,[4] by CHARLES WEYL and S. REID WARREN, jun., is a thorough and complete account of the electrotechnics associated with radiography of the chest. It deals with the physical phenomena underlying radiography, with apparatus and its limitations, with the details of the various techniques employed in chest radiography, with localization, and with standardization of *x*-ray apparatus. The opening chapter gives a short account of the physical phenomena on which the principles of chest radiography are based. Chapter II gives full descriptions of high-voltage generators, and many diagrams by way of illustration. A description of the various types of *x*-ray tubes follows, with special reference to the new rotating anode tube. The *x*-ray film and the dark-room technique are fully described, as are also many of the various instruments connected with radiography, such as stabilizers, thermionic-valve tubes, casette changers, Potter-Bucky diaphragms, portable equipments, etc. Chapter III deals with radiographic technique. Chapter IV is devoted to the physical measurements. An appendix on elementary electrical theory, direct and alternating currents, and alternating current measuring instruments has been added for those readers who are not familiar with the basic electrical principles involved in radiography. It seems a pity that "tomography," or sectional radiography, has not been included, as this recent development is of special value in radiography of the chest. The book is a highly technical one which will be of use as a work of reference for those who take a special interest in the physical aspects of radiography.

AN ODD STORY

In a remarkable novel, *His Patients Died*,[5] Dr. LILLINGSTON asks, in effect: Euthanasia—should it or should it not, be practised? What he himself thinks is not clear. He is content to describe the incredible career of a quite incredible person, Dr. Skooner. This odd creature started while a resident at a London teaching hospital by contriving deaths on the table when he was a resident anaesthetist, deaths in the wards when he was a house-surgeon. Apparently the authorities did nothing about it, which seems unlikely. Next he set up as a G.P. under unusual circumstances, and almost at once his patients began dying in what to a normal practitioner would have seemed a highly disconcerting manner. One of the first was a woman who, after a row with her husband, announced that she had swallowed open safety-pins, which she hadn't, and shortly afterwards was found in a nicely ordered, and apparently not blood-bespattered, bed with her throat efficiently cut. That set the coroner going, and he was kept busy at intervals for twenty years. Then, tired by his exertions, Skooner settled in London, where he met some very eccentric people. Among them was a high-up Scotland Yard official with a passion for fairy-tales, who at once made a hobby of protecting Skooner. There followed a number of violent deaths in which Skooner was involved, but, until the last, with complete immunity. Once, when he was killing an already half-murdered man by giving him too much chloroform in the operating theatre of the hospital, where he had no business to be performing, the patient was saved by the junior "pro," while Skooner was whisked away for a whisky and soda by the Scotland Yard man, who had arrived mysteriously in the theatre. How he got there is not made clear.

The book must be read for amusement. It provides plenty. It is very funny indeed in places. It throws light on certain phases of medical life which are unusual, sometimes unique. As a studied contribution to the discussion on what is a highly controversal subject it cannot be taken seriously. That is a pity. The theme is a good one. Unfortunately the treatment is so fantastic that the finished product can arouse nothing but laughter. Perhaps, though, that was the author's aim. If so he has succeeded. This is a troubled world. Anything that will move us to mirth should be welcomed.

BACTERIOLOGY

Bacteriology in Relation to Clinical Medicine,[6] by Professor M. N. DE and Dr. K. D. CHATTERJEE, is a departure from the usual type of bacteriological textbook. In the first place it does not contain those sections devoted to the pathogenic protozoa and fungi which usually find a place in works of this kind. In the authors' opinion the practice of including odds and ends of parasitology in a textbook of bacteriology is to be deplored, since it may lead to a casual and inadequate study of the former subject. They are probably quite right in thinking so, but there is another good reason for the practice which they have followed, and that is that the science of bacteriology is concerned with bacteria and should not be turned into a sort of parasitological scrap-heap. Another feature of this book is that the clinical aspect of the subject is brought into greater prominence than usual. The pathological processes to which the various bacterial species give rise are described in detail, and frequently form the subject of well-chosen illustrations; the laboratory diagnosis of these diseases also is discussed at considerable length. Apart from these points the arrangement of the book follows the usual practice. In the earlier chapters general matters such as classification, staining methods, sterilization, culture media, and the study of cultural characters are dealt with. A useful chapter on infection precedes a discussion of immunity, which occupies some hundred pages. Then comes the description of the different bacterial species of importance in human medicine. Each of these chapters is modelled on a common plan. The various characteristics of the bacterium are first described, then the way in which it produces disease is discussed, and, finally, specific therapy and prophylaxis and laboratory diagnosis are dealt with.

Generally speaking, the information contained in this book is accurate, up to date, and well arranged. It is not overburdened with detail, and wherever an illustration

[4] *Apparatus and Technique for Roentgenography of the Chest.* By Charles Weyl and S. Reid Warren, jun. Springfield and Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1935. (Pp. 166; 38 figures. 22s. 6d.)

[5] *His Patients Died.* By Claude Lillingston. Edinburgh and London: W. Blackwood and Sons Ltd. 1936. (Pp. 317. 7s. 6d. net.)

[6] *Bacteriology in Relation to Clinical Medicine. Theoretical and Applied.* By M. N. De, M.B., M.R.C.P., and K. D. Chatterjee M.B. Calcutta: The *Statesman* Press. 1935. (Pp. 599; 276 figures (42 coloured). 30s. net.)

is capable of making things clearer one has been included; in fact the illustrations, many of which are in colour, are very good and form a feature of the volume. Probably in any book, however good, there are things which are open to criticism, and here and there in this one minor points crop up which the reviewer would like to see corrected in subsequent editions. In the section on immunity, for instance, it seems unnecessary to describe the technique of the opsonic index in such detail, since this procedure no longer enters into everyday laboratory work. And the discussion on the serum therapy of streptococcal infections does not convey an accurate picture of the present position. It is surely incorrect to say that an acute toxaemia is a feature of most fatal streptococcal septicaemias, and to ascribe the failure of streptococcal (anti-bacterial) serum to a lack of antitoxin. It is just such faulty reasoning which has led to the unscientific and unprofitable use of streptococcal antitoxin. Why, too, should Parish and Clark be given the credit for the demonstration of staphylococcal exotoxin? Surely this should go to Burnet. Filterable viruses receive short shrift. Thirteen pages in a book of close on 600 is entirely inadequate treatment of these important pathogenic agents. However, these are minor defects in an otherwise excellent textbook. It is very well produced, and possesses an adequate index.

Notes on Books

The Transactions for 1935 of the German Society for Investigation of the Circulation[7] contain a large number of contributions on a variety of subjects. The society organized a discussion on the relation between circulation and respiration, and the first eight communications deal with this subject. An article by Dr. Hochrein contains an account of some very complete and delicate experiments on the pulmonary circulation. Dr. Benninghoff gives a detailed description of the anatomy of the large vessels, and Professor F. Schellong contributes an article on acute cardiac lung oedema. The remainder of the volume contains articles on various problems. One of the most interesting features of these articles is the number and variety of new methods that have been evolved for the measurement of changes in the circulation of animals and in man.

Mr. HARRY PRICE'S *Confessions of a Ghost-Hunter*[8] have, for the most part, already enlivened the pages of *The Listener*. The lay reader will find the book stimulating enough. Mr. Price has immense experience and an intimate acquaintance with scientific apparatus. Of this perhaps he makes rather unnecessary parade in contrast with the absence of corroborative testimony for the more startling experiences he describes. He tells us that he has not wished to burden the reader with such details: are we then to take it that the lengthily described weird experiences of witnesses are all worthy of credence? His attitude towards his own experiences is exasperating. At "the most haunted house in England" he and a reporter, we are told, saw an apparition in the grounds, and the latter saw it vanish on approach. He heard, we gather, bona fide and intelligent "raps" behind a mirror—a cake of soap flew across the room: surely such remarkable experiences were worth the fullest scientific description? But Mr. Price writes: "I could fill many pages with what I saw and heard, but, short of living in the house, found I could do little more there." He returned notwithstanding, two years later, and describes even more remarkable experiences: "We saw even stranger things"; he even more strangely concludes, "so strange that my lips are sealed . . . but we came to the conclusion that the supernormal played no part in them." The student will hardly forgive him for abandoning "in mid-air" the mystery of the tall horrific stranger, four times encountered, and of the old man with the thermogenetic stare! Kuda Bux's fire-walk is described in full, but with no reference to criticism, and mediumistic evidence for survival is discussed without mention of the "cross-correspondence" experiments of the Society for Psychical Research. Mr. Price's experience with the "clairvoyante" Mlle Laplace are very remarkable, but he seems to be unaware of Mrs. Sidgwick's interesting theory, based on good S.P.R. records, of a telepathic *nexus* between the sensitive, the sitter, and an absent acquaintance of the latter. Mr. Price's attitude towards the S.P.R. does him little credit as a scientist. The chapters on "hyperaesthetes" and mediumistic trickery of the stage kind are interesting, and these fill nearly half the book.

The number of entries in the 1936 edition of *Nursing Homes*[9] has again increased, and now totals approximately 4,000. The publishers state that all entries have been subjected to a careful revision, and that this volume represents the most complete list of registered nursing homes and is as accurate as it is possible to make a directory of this kind.

[7] *Verhandlungen der Deutschen Gesellschaft für Kreislaufforschung.* VIII Tagung. Edited by Professor Dr. Eb. Koch. Dresden and Leipzig: T. Steinkopff. 1935. (Pp. 262; 80 figures. RM. 15.)

[8] *Confessions of a Ghost-Hunter.* By Harry Price. London: Putnam and Co. Ltd. 1936. (Pp. 296; illustrated. 10s. 6d. net.)

[9] *Nursing Homes.* London: Benn Brothers Ltd. 1936. (Pp. 279. 4s. post free.)

Preparations and Appliances

A NEW OPERATING MASK

R. E. TOTTENHAM, M.D., F.R.C.P.I., F.C.O.G., obstetrician and gynaecologist to the City and County Infirmary, Londonderry, late professor of obstetrics and gynaecology, University of Hong-Kong, writes:

I am indebted to Messrs. Allen and Hanburys, who have most kindly brought out this mask at my suggestion. It is made of very thin stainless steel, and is triangular in shape, with rounded corners, being curved from side to side to fit the chin. The base of the mask is reflected upwards for about half an inch on its posterior aspect. This portion rests just above the prominence of the chin; the apex of the triangle covers the nostrils, and may rest against the nose or not, according to the wish of the operator. The mask is kept in place by a thin piece of tubing passed through a hole at each angle of its base. The length is easily adjusted, and the tubing does not require a knot; the loose ends are merely folded back and tucked around the main piece of the tube. My original object in bringing out this mask was to increase one's comfort while operating in a tropical country, but I have used it here at home, even in the winter, and like it better than anything of the kind that I have ever worn before. I regard it as possessing the following advantages: (*a*) It is easily sterilized, either by boiling or by immersion in spirit. (*b*) It is impervious to direct droplet infection from the mouth when talking or breathing, the expired air escaping round the sides of the mask. (*c*) It can be carried unsterilized in a midwifery bag, and can therefore readily be used in private houses. (*d*) And lastly, it is cool and comfortable to wear.

"EUCORTONE" (CORTIN A. & H.)

Allen and Hanburys Ltd. announce a new concentration in "eucortone" suprarenal cortex extract, amounting to two and a half times the present strength, with a corresponding reduction in dosage. "Eucortone" will now be supplied in 10 c.cm. instead of 25 c.cm. phials. The price is reduced from 36s. to 30s.

British Medical Journal

SATURDAY, APRIL 11th, 1936

THE "HOLISM" OF THE PATIENT

In the past there has been an unfortunate tendency to draw too hard-and-fast a line between the mind and the body. Just as materialistic medicine was apt to ignore the influence of the mind on the body, so psychiatry often forgot the influence of the body on the mind. Adler's views on the effect of organ inferiority in developing a neurosis originally attracted attention to his doctrine of individual psychology, though he himself has now allowed this to fall into the background of his teaching. But it is a safe assertion that the individual is most likely to break down if submitted to the combined strain of a difficult environment and a physical disorder. Even after this had been recognized in the psychoneuroses there was a delay in applying it to the psychoses. But that it did so apply was repeatedly emphasized by the late Sir Maurice Craig, and, apart from the remarkable personal influence he exerted over his patients, this was the most valuable aspect of his work. As was said of him in a recent letter to the *Times*, " he never failed to attach the correct value to the physical condition of his patients." One of his favourite methods was an exhaustive search for a toxic focus, which he was persuaded was an important factor in certain severe mental disorders.

The case reported by Mr. Norman Dott and Dr. Harrowes in another column exemplifies this principle admirably. A woman with a father-fixation was greatly upset by his second marriage. As she had not wished this to happen she convinced herself that he did not wish for it either, but had been dragged into it. Thus a hostility to the stepmother which might have remained latent became openly expressed in an exasperating way. During the war she served with the Forces and was well and happy, but she had insufficient insight to realize at the end of the war that this showed she still needed an absorbing occupation away from home, and so she made no effort to obtain one. She passed into a stage of mild depression and also began to complain of a pain in the lower part of the face, which was found to be due to infection of both maxillary sinuses. The sinuses were washed out and the depression gradually cleared up. Unfortunately no use was made of this interval to seek the aid of psychotherapy, and she relapsed into a state of suspicion, to which her deafness contributed, as it so often does. It would, incidentally, be interesting to make a psychological inquiry into the reasons for the contrast between the suspiciousness of the deaf and the optimism so commonly displayed by the blind, whom one would regard as suffering from a much more serious handicap.

Gradually definite psychotic symptoms appeared and developed along typical lines, which were not checked by the death of the patient's hated stepmother. But she also developed a severe pain in the head, which, as might be expected, she attributed to external agencies. Had her medical attendants regarded this persistent pain merely as part of her psychotic symptoms her condition would in all probability have continued to deteriorate. Fortunately they did not, but proceeded to investigate the cause of the pain, largely because they were struck by the fact that her statements about this pain differed in tone and reasonableness from almost all her other remarks. They noted, also, that it was the appearance of this pain and its paranoid interpretation which had induced severe mental symptoms in place of the previous depression. Sensory changes were detected in the region supplied by the left supraorbital nerve, and an operation was accordingly decided on. A bony bridge was found across the supraorbital notch, which obviously constricted the nerves on both sides. Each nerve was cut well back along the orbital roof. Microscopically they showed extensive myelinic degeneration. The patient was discharged to her own home, convinced that her pains had vanished. Whether the cure would have been permanent must remain unsettled, for unfortunately she died of influenzal pneumonia shortly afterwards. But at any rate the case illustrates the important influence of the physical condition on the mental state. An additional point as bearing on Adler's theory of organ inferiority was that this patient was handicapped by a severe degree of cleft palate.

The case presents another interesting feature. A psychoneurotic became definitely psychotic. There has been a tendency in certain quarters to separate psychoneuroses completely from psychoses, and to maintain that the former do not develop into the latter. At a recent discussion two well-known psychiatrists totally denied this, and if they are correct the outlook becomes more hopeful for treatment. For we may then hope that adequate treatment of accessible psychoneurotics will prevent their becoming inaccessible psychotics. But the chief lesson to be drawn from the case is the " holism " of the individual, recognition of which should make us a little less glib in our distinctions between the functional and the organic.

CHRONIC COLITIS

Chronic affections of the colon present many interesting problems, and these are fully discussed by the authors of a recent French book.[1] It has been customary to divide the subject into the functional and organic diseases of the colon. This Drs. Chiray, Lardennois, and Baumann will have none of. For them colitis should rightly include the whole range, from the mildest affections of the mucous membrane (colite endomuqueuse), through those involving the whole wall of the gut (colite pariétale), to a condition

[1] *Les Colites Chroniques. Etude Clinique—Traitement Médical et Chirurgical, avec un exposé de Bactériothérapie.* By M. Chiray, G. Lardennois, J. Baumann. Paris: Masson et Cie. (65 fr.)

of diverticulitis. These affections differ much in aetiology. The muco-membranous colitis arises usually from abnormal contents of the bowel ; and the watery contents from abuse of laxatives and purgatives produce an irritation which is more often due to chemical than to infective material. The authors would have it that anaphylaxis to toxins may contribute in many cases in which nervous symptoms and eosinophilia are present. Non-specific ulceration of the colon they ascribe to abnormal activity of the usual intestinal flora. They also discuss specific ulcerative colitis due to dysentery—amoebic, bacillary, and protozoal—and vascular disease of the colon. The several types are illustrated by pictures of the characteristic *x*-ray appearances. Since Chiray, Lardennois, and Baumann lay emphasis upon the essential unity of colitis, its degree varying with the toxicity of the exciting cause and the resistance of the patient, they consider therapeutic measures as a whole. The various methods of treatment by soothing the inflamed mucous membrane of the bowel, by antiseptics to cleanse the contents, and by bacteriotherapy of different kinds, vaccines and sera, are fully dealt with, and all that has become established in practice is included in the survey. Dieting is rather sketchily done, and more might have been made of conditions of chronic deprivation of vitamins in the causation of mild mucous colitis. Surgical measures have now much less vogue than formerly: operations for stitching up the ptosed or redundant colon are no longer advocated ; appendicostomy or colostomy may be useful in some cases to rest the lower bowel and to allow of gentle intestinal lavage from above in the natural flow of the contents.

From the United States comes a book on the *Management of Colitis*,[2] in which Dr. Bargen discusses colonic disturbances of systemic origin under the heading of "irritable" or "unstable" colon, preferring this term to describe conditions commonly called colitis "which in fact ought never to masquerade under that name." The form more often described as muco-membranous colitis is an intestinal disorder which is only part of a general disorder. It appears to be more common in the present-day life of rush and bustle, hurried meals, and excitement. Among local irritants are cathartics and colonic irrigations, very often used to the point of creating great discomfort and much over-activity. Sensitiveness to the bacteria normally present in the intestinal canal has been demonstrated ; sensitiveness to certain foods is noted in some cases, and a lack of hydrochloric acid in the gastric contents has been found to stimulate intestinal over-activity. The sensitive colon may be inherited and neurogenic trends are almost invariably present—nervous tension, anxiety, worry, introspection, and insomnia. Much may be done for susceptible individuals by cultivating a healthy habit of defaecation. For active treatment the patient's psychological background must be studied, with re-education of the emotional and mental reactions. A bland diet is usually best, but some individuals need and tolerate much bulk in their food. Dr. Bargen advises skin tests to determine if there is any specific sensitiveness to certain foods or bacteria. Rest is an important therapeutic agent, with moderate exercise in the open air, avoiding physical fatigue. Great things can often be accomplished by the simple expedient of keeping the hands busy, and stress is laid on the good results of suitable occupational therapy. Medicines are reduced to meeting the actual indications, but the author advocates belladonna for relief of spasm and dilute hydrochloric acid when achlorhydria exists.

Dr. Bargen devotes the main part of his monograph to ulcerative colitis, a study of which has occupied him for many years. He insists that one should never be satisfied with the diagnosis until a careful investigation of the stools and of the patient—clinically, radiologically, and bacteriologically—has been made, and the nature and cause of the complaint determined. It is of the greatest importance not to miss a growth of the colon, thus preventing radical treatment while the condition is operable. In a concluding chapter he gives a capital summary of the main points of differential diagnosis from other like conditions. The causation of non-specific ulcerative colitis is broadly discussed, but Bargen's work, as is well known, has led him to incriminate a diplostreptococcus which he has recovered from the bowel in 80 per cent. of cases at the Mayo Clinic, and which shows specific reactions culturally and on inoculation into rabbits and dogs. He therefore insists on the help obtained in treatment of these cases by sera and vaccines made from the organism. Very small doses are given—1.5 c.cm. to 3 c.cm. of serum intramuscularly or intravenously. He does not dwell at undue length on this specific treatment, but discusses adequately the other measures of diet, nursing, irrigations, and drugs. An important thing is to remove all foci of infection. Apart from this, surgery is called in aid now less than formerly.

[2] *The Management of Colitis.* By J. Arnold Bargen, M.D., F.A.C.P. New York: National Medical Book Co. Inc. (4 dollars.)

THE SERUM TREATMENT OF PNEUMONIA

The United States retains its monopoly of really large-scale studies of lobar pneumonia. The high fatality rate from this disease in America has been a stimulus to the organization of facilities for serum treatment which are generally lacking in this country. The first of three projected reports[1] dealing with the "Massachusetts pneumonia study"—an attempt at furnishing facilities for bacteriological diagnosis and serum treatment in cases under the care of general practitioners, and financed by the Commonwealth Fund—contains a short account of the history of treatment with serum, a discussion of the aetiology of pneumonia (including a statement of the distribution of pneumococcus types among different varieties of the disease), detailed instructions for giving serum, and a statement of results so far obtained ; these are closely analysed in a number of ways in order to bring out the influence of various factors on the outcome. There

[1] *Lobar Pneumonia and Serum Therapy.* By F. T. Lord and R. Heffron. New York. 1936.

can be no doubt of the favourable effect of serum treatment on Type I cases, and in this series the mortality in Type II cases was also reduced from 41 to 27 per cent., a result more favourable than that in Blake and Cecil's earlier series. It is recommended that the serum be given in increasing doses at intervals of two hours until 60,000 units have been given in Type I cases and 100,000 in Type II. Only the intravenous route is recommended, no other being mentioned. In view of Curphey and Baruch's[2] experimental results by intramuscular administration it had seemed reasonable to hope that this route might be feasible, and the general question of whether intravenous serum has some advantage not merely dependent on rapidity of action, and whether absorption from tissues really is so delayed as is usually assumed, is one that seems to merit the attention of those interested in this subject and in serum therapeutics. For typing, the direct method originally described by Neufeld is recommended, although it is admitted that mouse inoculation may sometimes be necessary ; in view of the difficulties and pitfalls of the direct method it would be of value to know in what proportion of cases it proved inapplicable, and whether its results have been shown to tally invariably with those obtained by other means. The total number of cases included in this study is 956, a formidable figure which no investigator in this country can approach, and the experience which they represent must command respect. Anyone interested in the subject, particularly if he intends practising serum treatment, will find this publication of much practical value.

SEX HORMONES IN TUMOURS

There is a good deal in recent observations to suggest that oestrin may be connected in some mysterious way with the origins of neoplasia. Not only does the experimental administration of oestrin cause remarkable proliferative changes in certain organs, and according to Lacassagne and others increase the frequency of carcinoma of the breast in mice, but this hormone is chemically related to an actively carcinogenic substance, dibenzanthracene, and at least one compound has been synthesized which experimentally is both oestrogenic and carcinogenic. Another interesting point is that the "organizer" of the embryo is apparently related chemically to oestrogenic compounds. Geschickter and Lewis[3] claim to have demonstrated that very large amounts of oestrin, and sometimes also of prolan, are recoverable from certain tumours, both human and animal. The yields amount sometimes to thousands of units per kilogram of tissue, a quantity greatly exceeding that to be found in any normal tissue, even the ovary. The tumours assayed were apparently, with two exceptions, innocent, most of them being uterine fibroids or mammary fibroadenomata, and the yield of oestrin varied greatly, some tumours furnishing none at all. These observations are reported briefly at the end of a long and otherwise orthodox and featureless review of the subject of tumours of connective tissue, and the brevity of their description and discussion leaves a number of questions unanswered, in the matter both of fact and of interpretation. The authors, however, commit themselves to the belief that tumours of connective tissue are capable of concentrating and storing oestrin and prolan, and that these hormones are "in all probability concerned in the physiology of the tumour."

[2] *Journ. Exper. Med.*, 1932, lv, 925.
[3] *Amer. Journ. Cancer*, 1935, xxv, 630.

CHRONIC MILIARY TUBERCULOSIS

Ranke's conception of tuberculosis as a disease presenting three distinct phases attracted much attention, but also invited severe criticism ; for it implied that tubercle bacilli could pass into the blood stream without necessarily leading to death within a short time. The publication by Sayé and Bernand in 1924 of several cases showing the features of a generalized miliary syndrome, but adopting a course extending over one or more years, brought this conception well forward into the clinical field. And the work of the German and French schools, particularly that of Jacques Delarue and of Walter Pagel, finally provided a sound morbid anatomical basis for these new clinical forms of tuberculosis, which so far have hardly been discussed in this country. At the annual provincial meeting of the Tuberculosis Association held at Cambridge last week (of which an account appears elsewhere in this issue), Professor Sayé of Barcelona, who has made the clinical aspect of this subject his own, gave a comprehensive and succinct account of chronic miliary tuberculosis. He dealt briefly with the morbid anatomical investigations which have led to the differentiation of two, not always strictly delimited, varieties: (1) chronic generalized forms in which the bony, renal, glandular, etc., lesions predominate, while the lung lesions remain minimal ; and (2) the haematogenous pulmonary forms, which remain localized to the lung and assume the picture of phthisis, and in which at necropsy discrete but definite lesions are also found in other organs. Other differences in regard to situation, number, and stage of lesions have also been worked out by Pagel, who has emphasized the pathognomonic character of the round thin-walled "silent" cavities in the haematogenous pulmonary forms. Moreover, the two varieties have been shown to have a different origin and a tendency to terminate differently: the first in meningitis or acute miliary tuberculosis, the second with signs of laryngeal or intestinal involvement. Professor Sayé then classified chronic miliary tuberculosis into five clinical forms, the main features of each being indicated and illustrated with typical case histories and excellent skiagrams. In children chronic miliary tuberculosis may follow primary infection and present discrete pulmonary symptoms and signs and foci in other organs · complete recovery may occur with fibrosis or calcification of the miliary lesions. Similar chronic generalized forms may develop from healed primary foci both in children and in adults, and while they differ in their course the characteristic slight pulmonary involvement remains a prominent feature. To most tuberculosis workers the localized chronic haematogenous form will be of particular interest, since clinically it may adopt the course of phthisis with exudative and ulcerative lesions ; generalization (laryngeal and intestinal) occurs only at the end, although exceptionally the bacillaemic nature of the illness is shown by the appearance of extrapulmonary lesions during the course. On the other hand, the epidemiologist's attention will probably

be attracted to the "non-apparent" forms discovered in the routine examination of supposedly healthy communities, Professor Sayé having particularly investigated a large number of university students. Few will wish to criticize Professor Sayé's demonstration of the usefulness of the search for tubercle bacilli in the gastric contents. But his insistence on sanocrysin as a method of treatment of chronic miliary tuberculosis, and of B.C.G. vaccination in childhood as a measure for their prevention, may meet with scepticism. Judgement will, however, have to be reserved until such time as the universal recognition of these forms of tuberculosis and the adoption of B.C.G. vaccination will enable comparative work to be produced.

P.U.O.

Probably no problem in clinical medicine affords so much interest and so much anxiety to the physician as the diagnosis of obscure fever, and there are many instances where the final label remains "pyrexia of unknown origin." A scientific analysis of groups of such cases is difficult: many papers have been published dealing with the theoretical aspects of the subject, the possible causes of fever, and the investigation thereof, but a critical review of any large series with the final solution of the various puzzles has not often been attempted. Special interest must therefore be attached to a recent contribution by L. Hamman and C. W. Wainwright[1] of the Johns Hopkins Hospital, Baltimore, which is the first part of a larger work, and deals with the diagnosis of unexplained long-continued low-grade fever. In this group they place febrile patients whose temperature only occasionally exceeds 100° F., rarely reaching 101°; their symptoms are not severe, and they are usually ambulant. Such patients complain of weakness and lassitude; they may have local symptoms of headache, palpitation, or indigestion; they have usually been through various more or less drastic therapeutic procedures (with loss of teeth, tonsils, appendix, gall-bladder, etc.) and yet they feel no better and their fever persists. All the patients in the present series have been submitted to the fullest possible diagnostic investigation, and they are classified eventually into three classes. In 40 per cent. characteristic signs and symptoms have developed, making an accurate diagnosis possible; in about 50 per cent. the symptoms slowly subsided and the patients recovered without a well-supported diagnosis ever being made; and in 10 per cent. the symptoms and fever have persisted for many years without a satisfactory cause being found. The accurate diagnoses arrived at in the series included undulant fever, pulmonary tuberculosis, hypernephroma, and Hodgkin's disease. It is in the third group, however, that most interest centres: fever was continued in one member of this series for thirty years! It is concluded that those patients for whom no satisfactory diagnosis was ever made must have been suffering from some mild specific infection (tuberculosis, undulant fever, rheumatism), a focus of specific infection (tonsillitis, appendicitis, pyelitis), or from something more obscure and uncertain, such as a metabolic disorder or neurogenic fever. In the course of discussing this further subdivision in greater detail the authors make many interesting generalizations. For example, they are prepared to defend the statement that "whereas tuberculosis is the most common cause of long-continued slight fever, it is seldom the cause of *unexplained* long-continued slight fever." Mediterranean or Malta fever is now being increasingly recognized (although more usually termed "undulant fever" in this country), and as for rheumatic fever the present authors "are convinced that if we had the opportunity for prolonged observation many children with unexplained fever would later develop the unmistakable signs of valvular heart disease." Discussing what they term the "beguiling" theory of hidden septic foci the authors review their experience, which appears to have been more or less uniformly disappointing in this field. In the last group of metabolic and neurogenic fevers there is much room for speculation and little scientific evidence for accurate study. Ichthyosis as a profound upsetter of the heat-regulating mechanism is mentioned as a possible "catch." Endocrine disorders have to be considered, but neither of these is likely to produce a fever which is for long "unexplained." Concerning fever of nervous origin, it is suggested that the physician may admit the general possibility of this diagnosis yet never venture to make it. For his guidance in this respect certain observations are made, with due warning that although a temperature between 99° and 100° may possibly be normal for a particular patient, the physician is never justified in making this diagnosis. Hysteria, psychosis, and psychoneurosis may each be associated with fever, and further, "that obscure clinical condition called 'effort syndrome'" is nearly always accompanied by slight rise of temperature.

[1] *Bull. Johns Hopkins Hosp.*, February, 1936, lviii, 109.

EXPERIMENTAL RADIOLOGY OF THE HEART

In spite of the notable advance in radiology of the heart in recent years, the accuracy of information so obtained still lags behind that in radiology of the lungs. While it is comparatively simple to decide whether there is enlargement of the organ, it is much harder to determine the part of the heart responsible for any abnormality. To avoid distortion of the image an apparatus with the tube six feet from the patient is now employed. A diagram of the contour of the heart is obtained by cutting down the aperture to a fine beam and working it round the outline of the heart; this is pencilled on the screen and subsequently transferred to drawing paper. Orthodiagrams are made on the same principle: by means of a suitable device points made by the operator as he works round the contour of the heart with the central ray are registered on a sheet of a paper fixed to one side. Finally, teleradiographs, which form accurate permanent records of the heart shadow, can be obtained by means of a special powerful apparatus giving sufficient contrast at six feet. All these examinations are carried out in the two oblique positions as well as in the antero-posterior, and they enable the size of the heart to be appreciated with a fair degree of accuracy, provided related factors such as build, sex, size of thorax, and spinal deformities are taken into consideration. This is not the case, however, when the responsible component in an abnormal heart shadow is being sought. Laubry, Cottenot, Routier, and Heim de Balsac,[1] point this

[1] *Presse Méd.*, 1935, xliii, 2071.

fact out, and briefly describe the experimental method employed by them to increase our knowledge on this subject. It comprises systematic *x*-ray examination post mortem of persons cardiologically normal or pathological who had been adequately investigated both clinically and radiologically before death. The body is suspended in front of the apparatus with the feet resting on the floor, and *x*-ray photographs are taken at different angles after injection of an opaque substance (lead subacetate or barium sulphate). The latter is introduced into the right side of the heart through the jugular vein, and into the left side by means of the carotid artery ; the filling of each cavity separately is obtained by the use of devices that enable the heart to be rinsed out with water and by inflating the lungs in order to approach conditions of " thoracic-abdominal equilibrium " existing during life. Papers giving full details of this technique are being published by the authors in the *Journal de Radiologie et d'Electrologie*, and they claim that their work has already confirmed certain facts of radiological anatomy—for instance, the absence of any participation of the right ventricle in the right border of the heart, and the importance of the transverse position for examination of the right ventricle and left auricle. New facts they have brought forward concern the topography of the left auricle, the relation of the aorta to the other components of the upper mediastinal shadow in oblique positions, etc. The authors are now concentrating on pathological conditions, and have already collected fifty-three cases.

AMENDMENTS TO THE PHARMACOPOEIA

The British Pharmacopoeia Commission of the General Medical Council has just issued the collected reports on the material prepared for an addendum to the *British Pharmacopoeia* of 1932.[1] The *B.P.* at its last revision was subjected to very extensive alterations, and, indeed, the greater portion was rewritten: consequently a good many minor amendments have been suggested, and in addition a number of new agents have become well enough established to require standards ; the Commission has therefore determined to publish an addendum, and this is now in course of preparation. The report is published with the desire of eliciting criticisms and suggestions. The Clinical Committee suggests the inclusion of about twenty-five new monographs. The list includes several important drugs such as acetarsol, histamine acid phosphate, and tryparsamide, three new antitoxins, anti-pneumococcic sera (Type I and Type II), and three purified vitamins—namely, ascorbic acid, calciferol, and vitamin B_1. The Biological Committee has prepared draft monographs for the new antitoxins and sera, and has devised appropriate methods for biological standardization, and the Vitamin Committee has done the same for the new vitamin preparations. Other committees have prepared new monographs for the new chemicals and pharmaceutical preparations, and also have published numerous proposed amendments to existing monographs. The report in general does not propose any very drastic changes, but it is gratifying to note the number of new and important drugs that have become established during the past five years. The detailed directions in the monographs are of course highly technical, and we are impressed by the very large amount of careful detailed work that must have been needed for their compilation.

[1] General Medical Council. British Pharmacopoeia Commission, Reports of Committees. Published at the offices of the Council, 44, Hallam Street, W.1. (2s. 6d.)

AN IMPRESSION OF THE WORLD TOUR

Dr. R. D. Rudolf, emeritus professor of therapeutics in Toronto University, has contributed to the *Canadian Medical Association Journal* for March an interesting note entitled " Some Personal Impressions of the British Medical Association World Tour." As delegate of the C.M.A. to the Melbourne Meeting he went with the United States party from the British Isles, joining the party which had travelled across Canada at San Francisco. His paper includes a bird's-eye view of the clinical and scientific work in the Sections of Medicine and of Pharmacology, whose sessions he followed with close and critical attention. Speaking of the trip as a whole he says: " The tour was a very delightful one. Many well-known medical authorities were with it, but it was interesting to note that not a word of ' shop ' was talked the whole voyage ; except, of course, at Melbourne, where we had ample. . . . At every port we were welcomed by the local members of the British Medical Association, and were shown whatever there was of interest. One could not but be struck with the immense value of such a trip, not only as a means of bringing more closely together the profession, but, in a larger way, in helping to weld together the far-flung parts of the British Empire."

THE "EDINBURGH MEDICAL JOURNAL"

The current issue of the *Edinburgh Medical Journal* announces the resignation of the editor, Mr. Alexander Miles, M.D., LL.D., F.R.C.S.Ed., who has conducted it for the twenty-five years since 1911. This close of a long period of distinguished service and leadership has called forth a chorus of tribute and appreciation. The *Edinburgh Medical Journal* during an unbroken life of 130 years has played no small part in the development and work of the Edinburgh Medical School. It has carried the influence and reputation of this school throughout the world, and has done so, under the editorship of Mr. Miles, at a very high level. The maintenance of a high standard has been the task and the achievement of its editor, and it constitutes a substantial and lasting service to Edinburgh medicine, both in and beyond the limits of the University. Mr. Miles, while a distinguished editor, has at the same time been surgeon, teacher, and administrator in several fields of medicine. His many readers, contributors, and contemporaries must all be grateful to him for his conduct of the *Edinburgh Medical Journal* over this last quarter of a century. He is succeeded in the editorial chair by Dr. A. Rae Gilchrist, the former assistant editor.

His Majesty King Edward VIII has been graciously pleased to grant his patronage to the British Medical Association.

At a meeting of the Royal College of Physicians of London on April 6th Lord Dawson of Penn was re-elected President.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the blood and blood-forming organs met with in general practice.

TREATMENT OF THE LEUKAEMIAS

BY

L. J. WITTS, M.D., F.R.C.P.,

AND

W. M. LEVITT, M.D., M.R.C.P., D.M.R.E.

There are three main varieties of leukaemia: acute leukaemia, chronic myeloid leukaemia, and chronic lymphatic leukaemia. Acute leukaemia runs its course in a few weeks or months, and is invariably fatal. It often simulates a severe infection, and no treatment beyond the symptomatic is of any avail. Haemorrhage, infiltration of the tissues by leukaemic deposits, and intercurrent infection are the most fruitful causes of symptoms, and it is easy to be misled in diagnosis and treatment unless the blood is examined. Surgical intervention, as for enlarged tonsils, foul gums, or localized tumour formation, should be strenuously avoided, as it is only too likely to lead to fatal haemorrhage or infection. Irradiation by *x* rays or radium is rarely well tolerated, and is of little value except for the relief of lesions which are causing pressure or pain. Necrotic ulceration of the mouth and gums may be treated on the lines laid down for agranulocytosis,* together with the intravenous injection of neoarsphenamine, 0.3 to 0.6 gram at weekly intervals. Iron by mouth and injections of liver extract may be used in the ordinary dosage for anaemia. Transfusion may cause the symptoms to improve for a few days, but its effects are evanescent, and only rarely does it do more than protract a painful situation.

Chronic Leukaemia

The treatment of chronic leukaemia can be summed up as irradiation plus iron. Arsenic is often advocated, but is not as satisfactory as irradiation, nor is it free from serious disadvantages. The radiation is given in the form of *x* rays. Radium has been tried, and although it is probably true that the same results can be obtained by this means the large quantities of radium required and the difficulties in its application negative its general use. Chronic leukaemia cannot be cured; it is even doubtful if life is greatly prolonged by treatment. What is very important, however, is that the *quality* of the life remaining to the patient is vastly improved. Indeed, the improvement in the general condition after a course of *x* rays and iron is, as a rule, dramatic. The patient regains strength and appetite, he loses his breathlessness, he gains weight, and the spleen becomes reduced so that it may no longer be palpable. Most striking, however, are the changes in the blood picture. The red cells rapidly increase in number so as to approach the normal, and with them the haemoglobin. The white cells decline, even to a normal total, and the proportions of the various white cells also shift towards the normal. The latter phenomenon is more marked in myeloid than in lymphatic leukaemia, but even in myeloid leukaemia some immature cells usually persist in the blood stream after treatment, although in greatly reduced numbers.

Within a few weeks of treatment the patient returns to his work, to all outward appearance a healthy individual. Unfortunately after a period of two to three months to a year, or occasionally even longer, the symptoms reappear. Blood examination shows that the leucocytes have again increased, the red cells and haemoglobin have fallen, and further treatment is necessary. Another remission will be produced by treatment, although of shorter duration, and after a variable number of such cycles, with ever-shortening remissions, the disease finally becomes resistant to treatment, and death ensues. The total duration of the illness may be two or three years, but occasionally cases of longer duration are met with, even up to fifteen or twenty years. Spontaneous remissions may occur without any form of therapy.

The symptoms of leukaemia can be ascribed to three main causes: the infiltration of the tissues and the enlargement of glands; the presence in the circulating blood of excessive numbers of leucocytes; and the depression of the haemoglobin. Questions that not uncommonly arise are whether the patient should be treated when there are no subjective symptoms, and what level of white cells should be regarded as an indication for the resumption of irradiation. In the absence of indications to the contrary, the patient should be irradiated whenever there is gross enlargement of glands or splenomegaly, and whenever the white blood count rises above 50,000 cells per c.mm. The anaemia is usually improved by irradiation, but the improvement is much increased and accelerated by the prescription of iron.

X-Ray Therapy

Any case of chronic leukaemia, whether myeloid or lymphatic, should be treated by *x* rays. The rare aleukaemic cases are no exception to this rule, although in treating them the greatest possible care is necessary. Anaemia is no contraindication to *x*-ray therapy; a high basal metabolic rate, with nervousness, sweating, fast pulse, and loss of weight, is a definite indication. But the treatment should be interrupted at once if the clinical condition of the patient is obviously deteriorating, if the anaemia increases in severity, if the white count falls very rapidly, or if there is an increase in the number of immature white cells.

X-ray therapy in leukaemia is empirical, and the mode of action is not well understood. The rays may be applied to the spleen or to the long bones. The best results are obtained when the rays are applied to the spleen, although greater accuracy of technique and dosage is required than when the long bones are treated. Both methods lead to a gradual reduction in the leucocyte count and a shift towards normal proportions; but in the bone-irradiation method the coincident improvement in the red cells and haemoglobin is much slower. Attempts have also been made to treat leukaemia by total body irradiation. This method is a dangerous one, and no very striking results have so far been reported. In lymphatic leukaemia the glandular masses usually disappear spontaneously when the total white count is kept round about the normal level. Occasionally, however, it is necessary to irradiate the individual gland masses.

* Professor Witts's article on the "Treatment of Agranulocytosis" will appear in a later issue.

Radiological Technique

X-ray treatment is best carried out as a series of small doses applied to the spleen within the space of two to three weeks. Strict control of the treatment by blood counts is necessary throughout. At the beginning of the treatment one to four small daily doses of *x* rays are given, according to the acuteness of the leukaemic process; the more acute the process the greater the caution that has to be exercised in the treatment. A transitory increase in the white cells may occur within a few hours of the treatment, before the typical fall; it is therefore important to allow a clear interval of twenty-four hours after the last dose before carrying out a control blood count. The number and magnitude of the further doses is determined by the result of the blood count. In all, from eight to fourteen doses may be required to complete the treatment.

Treatment is stopped when the total white count has fallen to about 15,000; but in deciding when to cease treatment not only the actual blood count but also the rapidity of fall in the white cells has to be taken into consideration. The fall may continue for from two to four weeks after cessation of the treatment. As important as the effect upon the white cells is that upon the red cells and haemoglobin. Indeed, the immediate prognosis may be estimated with some accuracy by observing the effects on the latter. A steady rise in the red cells and haemoglobin gives a good immediate prognosis, while a fall in the red cells, and especially in the haemoglobin, in spite of splenic irradiation, indicates the probability of an early fatal issue.

It is desirable that the patient should be under observation in a hospital or nursing home during the first course of treatment, but when the measure of the case has been taken in this way further treatment may be ambulant. *X*-ray sickness may be relieved by the ingestion of fluids and glucose; by the daily intramuscular injection of 2 c.cm. of liver extract; or by the oral administration of a solution of adrenaline hydrochloride (*B.P.*), 10 minims, four-hourly, on the days when the patient is irradiated.

Iron Therapy

The patient's feeling of well-being during the course of his illness depends to a large extent upon the state of the red cells and haemoglobin. The results of treatment have greatly improved since massive doses of iron have been administered in conjunction with *x*-ray treatment, and iron is now usually administered throughout the whole duration of the illness. In the average case the following mixture will be found suitable, but if this is not well tolerated, other preparations may be used, provided always the dosage is adequate.

℞ Ferri et ammon. cit. ... ... gr. xxx
Glycerin. ... ... ♏ xv
Aq. chlorof. ... ... ad. ʒ j
ʒ j, t.d.s., p.c.

If there is a sudden exacerbation of the anaemia from haemorrhage or infection one or more transfusions of 500 c.cm. of blood may prove of great value.

Arsenical Therapy

The results of the administration of arsenic are similar though inferior to those of *x* rays, the great disadvantage being that prolonged administration may lead to the unpleasant effects of chronic arsenical poisoning. We do not recommend the use of arsenic unless *x*-ray treatment is not available, and we are opposed to the use of arsenic at the same time as irradiation is taking place. Arsenic is sometimes prescribed during remissions in the hope of warding off recurrence for as long as possible, but in our experience it is better to rely on *x*-ray therapy, and it is unusual for a patient who has become refractory to *x* rays to respond to arsenic.

Treatment is begun with a dose of 3 to 4 minims of Fowler's solution three times daily. The initial dosage is continued for two days, and then the total daily dose is increased by 3 minims. This amount is given for two days. Thereafter the dose is increased at the same rate until anorexia, the first sign of intoxication, is noted. This sign, as a rule, is first noticed when the dose reaches about 24 minims daily, and the subsequent increments in the drug must be added more slowly, at the rate of an increase of not more than 1 minim to the total daily dose. By such a method medication may be carried up to 12, 15, or even 20 minims, three times daily.

The dose must be increased until the desired effects are obtained or until the limit of tolerance has been reached, for it has been shown by Forkner and others that the best results require a dose which is near the upper limit of tolerance. When the blood has improved considerably or when the limit of tolerance has been reached, the Fowler's solution should be gradually withdrawn. The total daily dose may be decreased by 1 minim daily until the patient is taking about 5 minims three times daily, which amount may be continued without harm for at least several months. If, with the larger doses, rather severe toxic symptoms develop, the drug may be entirely omitted for forty-eight or seventy-two hours, and then resumed in doses equivalent to about three-fourths or two-thirds of the amount which the patient was taking at the time of development of the symptoms. From this point the drug may again be increased or decreased as indicated by the effects on the patient. The solution should be well diluted and given with or after meals. Arsenic by mouth appears to be far superior to the injection of salvarsan or its allies.

Other Forms of Therapy

Other leucotoxic drugs such as benzol have been used in leukaemia, but they are too dangerous to be recommended. Nor should the removal of the spleen be countenanced.

Loss of weight is sometimes a troublesome symptom; the diet should therefore be as nourishing as possible, and the appetite may be encouraged by a bitter tonic before meals. Restful holidays in the open air are helpful, but excessive exposure of the body to the sun should be avoided, as it may diminish the tolerance to *x* rays.

The General Nursing Council for England and Wales invites applications from registered medical practitioners for examinerships for the preliminary and final State examinations for the general part of the Register and for the supplementary parts of the Register, for mental nurses, nurses for mental defectives, sick children's nurses, and fever nurses. Examiners in anatomy and physiology should be medical practitioners of good standing who have held a resident or other post on the staff of a hospital, and who have had experience in teaching. Examiners in medicine or surgery must hold, or have held, a post on the medical or surgical staff of a hospital recognized by the General Nursing Council as a complete training school for nurses, and preferably should possess a university degree in medicine and surgery or hold the M.R.C.P. or F.R.C.S. diploma. Examinations are held three times a year. The names of examiners are entered on a panel, from which those selected to serve are called up as required. Forms of application and full information may be obtained from the Registrar, 20, Portland Place, London, W.1.

THE TUBERCULOSIS ASSOCIATION

PROVINCIAL MEETING AT CAMBRIDGE

A well-attended meeting of the Tuberculosis Association was held at Cambridge from April 2nd to 4th. Lectures and demonstrations were given in the Physiology School, and a large number of people had the pleasure of staying in St. John's College, where some 150 sat down to the annual dinner, including many distinguished visitors from abroad.

Dispensary Organization

The first subject for discussion, dispensary organization, was opened by Dr. R. H. HAZEMANN, Médecin Inspecteur Préfecture de la Seine. In a critical review of the dispensary organization in France, with special reference to the administrative county of the Seine, he said that the organization of the anti-tuberculosis campaign in France was practically autonomous. It was based on the existence of the "Dispensaire d'Hygiène Sociale et de Préservation Anti-tuberculeuse," to which was added a scheme of appropriate institutions for the sick, for those infected, and for healthy contacts. The main effort was directed to the welfare of children. The treatment of sick patients was restricted to private medical practitioners and to institutions. Most of the hospitals in France were public institutions. The supervision of hygiene and relief was entrusted to the 38,000 mayors under the administrative, but not technical, central authority represented by its ninety préfets. The organization of dispensaries was established within the framework of the work of the county under the more or less intimate control of the préfet, whose department décided the admission of patients to sanatorium.

In 1931 the crude general death rate of tuberculosis (all forms) was 15.3 per 10,000 (of which 15 per cent. were non-pulmonary), but a more accurate figure was probably 17 or 18 per 10,000 at least. Notification of tuberculosis was not compulsory, death certification was inadequate, and the need for the co-operation of private medical practitioners in these respects was of vital importance.

Rural dispensaries were grouped and organized either by a county health department (Office Départemental) under the préfet, or by voluntary county committees more or less under the control of the préfet. The dispensaries did not carry out any treatment except that of artificial pneumothorax, and consultations were free. Tuberculous patients could not be admitted to public sanatoria unless they had been recommended by the dispensary of their district, but the chief object of the dispensary was the examination and supervision of contacts and prophylaxis in the home by means of health visitors. The 792 dispensaries sent reports regularly to the "Comité National de Défense contre la Tuberculose," and looked after 330,000 families, comprising 640,000 individuals, of whom 41 per cent. are tuberculous and 12.5 per cent. sputum-positive. About half the dispensaries were directed by part-time medical practitioners. The present tendency was to employ full-time officers.

There were sixty dispensaries in the Seine district (of which half were in Paris) for a population of 4,900,000. Each dispensary had a definite district, and at its head was a chief medical officer, assisted by one or more other medical officers, the posts being part-time. In 90 per cent. of the dispensaries there were screening apparatus and all the equipment necessary for laryngeal examinations. The sixty dispensaries looked after 68,000 families, representing more than 106,500 registered individuals, of which 54 per cent. were tuberculous and 15 per cent. sputum-positive.

Patients leaving hospital or sanatorium were reported to the office or to the Anti-tuberculosis Committee of the county to which they return. The difficult problem to solve was that of after-care. An effective solution would be the transformation in each sanatorium of an ordinary department into an after-care department, with a medical officer made specially responsible for the work and a social worker charged with maintaining the liaison, from before the departure of the patient, with the family, the dispensary, and the departments dealing with public hygiene, with institutions, and with cheap dwelling-houses. Children when seriously ill were treated in a sanatorium and when only slightly affected in a preventorium. Healthy children of tuberculous parents could, until the age of 13 years, be placed in the country under constant medical and social supervision in centres of "supervised familial placement." Nevertheless, it appeared that the number of such admissions (under 7,500) was at present insufficient: this was probably due partly to inadequate public resources and partly to lack of education (or conscience) of certain parents; the unemployed, for instance, did not receive the family part of the dole unless the child remained at home. Tuberculous ex-Service men were compelled to separate themselves from their children if they wished to receive the annual sickness indemnity of 10,000 francs.

Dr. Hazemann showed an interesting film illustrating the life of children boarded out under the Grancher system.

Dr. M. R. HAYNIUS VAN DEN BERG, director of the Tuberculosis Service, Amsterdam, who spoke excellent English, said that the anti-tuberculosis campaign in Holland was carried out by voluntary organizations subsidized by the State, province, or municipality, while their activities were under the supervision of the Government Inspector of Health. There were one national association, eleven provincial societies, and 800 to 900 local societies. The National Association undertook general propaganda, the training of visiting nurses, tuberculosis research, etc. The dispensaries in each province were run by the provincial society. Where necessary the province was divided into districts. The central dispensary in each district and the branch dispensaries were in the charge of a whole-time tuberculosis specialist. Each central dispensary and many of the branch dispensaries had at their disposal an *x*-ray apparatus. It was only in the three largest cities that the dispensary was run by the local societies. The local societies carried out the prophylactic and social measures prescribed by the tuberculosis officer. In the larger places the local societies were tuberculosis institutions, with specially trained tuberculosis nurses, who devoted themselves entirely to the anti-tuberculosis campaign. The work of the dispensaries was much the same as in other countries, with two important exceptions: there was no compulsory notification and no actual treatment was given to patients. Refills for artificial pneumothorax had to be given at the nearest hospital.

In Amsterdam the work was strictly centralized, so that everything a patient needed could be obtained only through the dispensary. In spite of the isolated organization of the dispensary, the efficient co-operation of the general practitioners, as well as the various public authorities, resulted in practically all tuberculosis patients being notified. The admission of patients to hospitals and sanatoria was arranged in Amsterdam by the dispensary. The follow-up of patients after discharge and the social rehabilitation and after-care were undertaken by the dispensary and the visiting nurses. About one-half of the new cases were sent to the dispensary by general practitioners; one-third were contacts sent by the visiting nurses.

The prophylaxis for children from tuberculous families consisted chiefly in separation in the home. Removal of the children for several years (Œuvre Grancher) was hardly ever resorted to in Holland. Infants who would grow up in immediate contact with open cases and contacts, and who after the patient had been hospitalized proved to be still uninfected, were vaccinated with B.C.G.

ORGANIZATION AT LEEDS

Dr. NORMAN TATTERSALL, tuberculosis officer for Leeds, in an interesting paper on the dispensary organization in this city, said that such an organization could not be discussed separately: it was only one part of the complete tuberculosis scheme. In Leeds there was one large central dispensary, fully equipped for diagnostic work and special treatment, with *x*-ray, artificial sunlight, ortho-

paedic, and dental facilities. The main city sanatorium was only some three miles away, and large general hospitals were close at hand. The whole scheme was compact, and made easy the co-operation between dispensary and institutions.

Close co-operation with a number of agencies was an essential part of dispensary work. With the M.O.H. there was a weekly interchange of information on all notifications and deaths from tuberculosis. Every positive sputum finding at the city laboratory was reported to the dispensary so that prompt action could be taken if the doctor had failed to notify the case. The veterinary department inquired into the milk supply if that was suspected as a source of infection. The most important of the many " lines of communication " was with the general practitioner. The success of dispensary work depended largely on the confidence which practitioners placed in its work, and that could only be maintained by a constant interchange of information by personal correspondence. Co-operation with school medical officers was also important. Among other organizations connected directly or indirectly with the tuberculous patient, Dr. Tattersall referred to the valuable work done by the Care Committee.

One of the strong points in the tuberculosis service in the country was its legal and official relation to the Ministry of Health. Ministry control ensured uniformity of general procedure and organization. By standardizing the returns of the work of every tuberculosis department and making them available for comparison the Ministry could fairly well assess the quality of work in each area and bring pressure to bear on centres where the standard of achievement was not maintained. One other point worth stressing in favour of the British scheme was that the services of the dispensary and sanatorium were free to all without distinction of class.

The dispensary service had been criticized because of its alleged failure to find the early case. Dr. Tattersall considered that the standard of diagnosis to-day was appreciably higher than it was twelve years ago. In this radiology had played a great part. Its increased use had brought to light many cases which previously would not have been diagnosed with equal precision ; it had also excluded from notification hundreds of cases which would formerly have been notified on slight clinical grounds. The real failure to find the early cases was probably not the fault of either the dispensary or the doctor, but the fault of the patient in ignoring slight symptoms.

Discussing the question whether dispensaries should give treatment, Dr. Tattersall said that treatment which enhanced the preventive efficiency of the dispensary was thoroughly justified. For example, the carrying out of pneumothorax refills was, from the point of view of the tuberculosis officer, stimulating and interesting.

The Work of the Tuberculous

Professor FERNAND BEZANÇON, secretary-general of the International Union Against Tuberculosis, opening a discussion on this subject, said that there were few questions of greater practical importance, and it was impossible to give too much praise to Sir Pendrill Varrier-Jones, not only for having approached the problem but for having solved it. The English experiments of Papworth and Preston Hall were a splendid example which should be followed. They were the indispensable complement of the fruitful anti-tuberculosis work of the dispensary, for which they were also indebted to Great Britain, since it was in Edinburgh in 1887 that Sir Robert Philip created the first dispensary and also introduced into the anti-tuberculosis campaign a truly social as well as a medical spirit.

The village settlement was a very complex undertaking. To re-adapt to work individuals who were physically and morally handicapped, to give them a sense of discipline, to restore them to family life and its responsibilities, to find or create for them economic markets, appeared at first an almost impossible task. It was Sir Pendrill Varrier-Jones's rare merit to have understood the advantages offered by modern working conditions. Whilst elsewhere machinery was considered a source of unemployment and a rival to handicraft, he saw that it could make up for the worker's deficiencies: a tuberculous patient who worked an excellent machine was in a better position than a healthy workman with defective machinery. Sir Pendrill had been able to supply his tuberculous patients with magnificent factories equipped with all modern improvements. In 1934, at the height of the world-wide economic crisis, the Papworth sales organization found a market for more than £100,000 worth of goods.

CAPACITY FOR WORK

Dr. MAURICE DAVIDSON, in a paper on this subject, said that Paterson had laid it down that arrest of disease was meaningless if it did not imply a capacity to undergo the exertions and fatigues of ordinary life without the risk of fever and constitutional disturbance. The theme of graduated labour for the tuberculous appeared, however, to need some further elaboration. Two types of the disease illustrated the point—namely, the exudative type in a young adult presenting himself for examination whilst on full work, and the type of latent disease stirred up by unusual expenditure of mental energy. The present criteria of a patient's capacity were based upon too limited a conception of what was meant by the term " work." On the physical side division into grades, arranged more or less on a system which enabled the capacity of each individual to be decided by temperature and pulse chart, was essential. On the psychological side no attempt had yet been made to lay down a scheme of graduated mental or emotional work ; although the idea did not at the moment appear to be practicable, it was worthy of consideration.

In dealing with the after-care of the arrested case it was important to think not only of the industrial worker but also of the upper middle-class patient, liberated from sanatorium control and left to his own guidance. Indiscriminate advice to live in the open air, given without regard to physique and temperament, was fatuous. In estimating the capacity for physical exercise, not only clinical criteria but the blood sedimentation rate should be taken into account as well as the results of frequent *x*-ray examinations. It is not sufficiently realized that fresh secondary lesions in the contralateral lung were often unattended by any clinical manifestations. With regard to the details of different varieties of physical work, the chief problem was the choice of a suitable occupation for patients who had made a good recovery in an institution. Stereotyped insistence on the importance of the physical aspect sometimes led to a neglect of the psychological element, and patients were at times urged to forms of work for which they had little or no aptitude—for example, turning a bank clerk into an agricultural labourer or a librarian into a land agent. Subsequent discontent was a source of worry, and worry was a breeder of ill-health.

Dr. L. B. STOTT of Papworth Village Settlement began by referring to the anatomical aspect of the subject. Tuberculosis could be an acute disease, and, like any other acute general infection, it had a pneumonic stage. Obviously in such a case the victim was incapacitated for the duration of the disease. The patient with a healed primary focus in the lung, on the other hand, was of undisturbed working capacity, but during the establishment of the focus he might have been completely incapacitated or working in spite of toxaemia. In the life history of every case of tuberculosis there are doubtless periods during perifocal reactions (or the establishment of fresh foci) when the capacity for work stood at *nil*, the whole energy of the patient being occupied in serological and cytological defence. No one could tell whether a healed primary complex in a healthy individual would confer an adequate measure of immunity or proceed to an advancing pulmonary tuberculosis. Therefore in their deliberations as to the capacity for work they must make a decision in complete ignorance of the future. If they knew the prognosis they had doubts as to the capacity for work. If they knew the capacity for work they had doubts as to the prognosis.

Dr. Stott said that he did not think enough was heard about the anatomy of expression. They were apt to forget that there still was a platysma muscle in the human body, and that its action was to pull down the corner of the mouth in an expression of melancholy. The texture of the skin covering the sternomastoid and trapezius muscles and the colour of the lips often formed sufficient warnings of activity. They could all recall patients in whom, for instance, one glance at the hands belied every word the patient uttered: the fingers straight and the thumb on the same plane as the fingers—hands incapable of doing a stroke by reason of their history.

Having decided that the patient was anatomically fit for work, and noted the location and extent of his tuberculous lesion, they must next decide his physiological capacity—his response to effort. Of course no one was fit for any exercise if he was febrile. There seemed little reason to doubt that a febrile state meant that excretion of toxin was not rapid enough at normal temperatures, and it was unjustifiable to add the burden of fatigue toxin to that of the existing pathological toxin. For practical purposes the examination of the urine was one of the most useful physiological guides, and how a patient was excreting was a good guide to functional efficiency. The ratio of free acid to combined acid in particular gave warning of the danger of absorption of toxin.

Any consideration of the physiology of working capacity must include a very different subject—that is, the effect of tuberculosis upon the physiological efficiency of the ductless glands. Apart from anatomical destruction due to the invasion of a tuberculous process, it was possible to note glandular failure by reason of chronic toxaemia. Anyone who had made a practice of performing necropsies of tuberculous subjects would recognize at least two types of thyroid gland: the thyroid with large colloid spaces bursting with colloid; and the organ with enormous proliferation of the lining membrane of the colloid spaces and interstitial tissue, and practically no colloid at all. A young patient who died while he was in the febrile stage would be found with the first of these types. In the middle-aged man, who died after a war of attrition with chronic tuberculosis, there would be found the signs of thyroid failure, the thyroid having done its utmost to hypertrophy. All medical superintendents of sanatoria were familiar with the oldest inhabitant, vastly proud of his gain in weight, very little trouble about the house, and completely devoid of ambition. If he were not in a sanatorium he would be in an out-patient department for myxoedema. Such people lived in neutrality with tuberculosis and might well work. But the young man, with his rapid pulse and febrile reaction, was, on the other hand, completely incapacitated, though his lesion might not be nearly so gross.

Professor VON WEIZSAECKER, director of the Medical Clinic at Heidelberg, considered that the after-care movement was the result of a conception of medicine which affected not only the tuberculosis question, but the whole field of therapy. Not only do they inquire "What does the patient need?" but "How does the patient live?" They wanted to know not only what remedies would relieve his symptoms, but how society should behave towards the sick man. All this was not to be regarded merely as an additional task of the existing system of medicine. It was indeed much more, for it was based on a criticism of this system. Time and money were wasted in endeavouring to restore a function instead of being spent in adapting the diminished or altered function to existing conditions of employment.

"A man has had concussion and remains two months in hospital, where he cannot get well because he cannot work. But when he goes home he is still unable to make complete recovery because he is still unfit for normal employment. So he lounges about, obtains bromide, and grows worried, listless, and bad-tempered. At the end of four months his state of health is worse than it was on discharge two months previously. This condition we call the secondary disease. But if, six weeks after the accident, we can employ him as a locksmith (supposing he is a locksmith) we observe that, although he does nothing for the first three days, on the fourth day he begins to take an interest in his job, with the result that within two or three weeks his capacity for work is completely restored. In such a case therapy requires two or three months, whereas without the stimulus of work it would have taken six to ten months, or perhaps considerably longer."

It should be noted that even in the case of certain forms of manual labour the quality of the work (that is, its exactitude or beauty) was of greater importance than the output of physical energy required in its performance. On the other hand, capacity for work was not so much a question of physiological economy as of will power. It is therefore not surprising that neither the basal metabolism nor the absorption of oxygen showed characteristic alterations in the case of the tuberculous patient with impaired working capacity. Thus it was not possible immediately to estimate capacity for work from physiological figures.

A SWISS EXPERIMENT

Dr. E. BACHMANN, Switzerland, after referring to the regulations for post-sanatorium training and after-care, issued by the After-Care Committee appointed by the International Tuberculosis Conference, described a scheme which had been adopted in Switzerland by the League for the Combating of Tuberculosis in the Canton of Zurich. The Canton of Zurich, he said, has 600,000 inhabitants, and possessed, in addition to a number of hospital wards and hostels for tuberculosis, two cantonal sanatoria, situated respectively at 900 and 1,600 metres above sea-level, and together contained 400 beds. Four years ago, fifteen kilometres from Zurich, a training centre was established on a sheltered plateau 520 metres above sea-level. This institution now comprised a main building containing medical and domestic offices, together with wards for sixteen to twenty patients, three hostels connected by verandas, each with sixteen to seventeen inmates, and two workshops, one attached to the main building, which housed the machinery, and the other detached. The institution accommodated seventy patients. The patients admitted to the institution were those who had been so long under treatment in the two cantonal sanatoria that their clinical condition permitted carefully graduated employment. As to the mode of employment, in winter this was mainly carpentry and in summer gardening. The women were occupied in making overalls, underclothes, aprons for their own use, etc. Many patients never became fit for a full day's work, and so long as the second aim of the institution (colonization) remained unfulfilled they had, on discharge, to seek employment corresponding to their impaired working capacity. Except for employment in the workshops, the training centres were run exactly like ordinary sanatoria. Employment in the Zurich training centre corresponded to that in normal industry. The goods were therefore not sold by some charitable organization, but in the open market. All patients, whatever their original crafts, were employed in simple carpentry—namely, in making simple kitchen furniture, including tables, trays, small store cupboards, ladders, and so forth. Unlike certain larger institutions, they had no other industry except gardening, in which many of their patients were engaged from spring to autumn. Everything was made by machine that was machine-made in normal industry. There was one foreman for the whole of the carpenters' shop, and an ex-patient was permanently employed as skilled instructor on full wages. All other workers were patients. An ex-patient who was a gardener by profession was also a permanent member of the staff, and directed the gardening activities.

The great danger with such institutions was that if they were not run on strictly business lines their accounts showed considerable deficits, which must be continually covered by contributions from public and private funds. Such institutions, as a rule, ought not to be organized on too small a scale, in order that capital invested in machinery could be utilized and refunded; but a number of smaller institutions was preferable to one that was too large, especially when so many persons suffering from open tuberculosis with permanently impaired working capacity had to be admitted.

The paper read by Professor Sayé of Barcelona is referred to in an annotation on page 759 of this issue.

A Visit to Papworth

On Friday afternoon a large number of delegates paid a visit to Papworth Village Settlement. Only a superficial impression of the significance of the work being done at Papworth could be gained in the few hours spent there, but enough could be seen and understood to appreciate the fact that here was being carried out a profoundly important experiment in social medicine.

The industries at Papworth are not looked upon as "occupational therapy" to keep the patient's mind off himself. They are run on highly efficient lines and up-to-date machinery is installed. Real work is done and the goods produced are sold in the open market. The tuberculous worker is thus enabled to make an effective contribution to society. Furniture, leather work of all sorts, farm equipment (hen-houses, etc.), are made and sold. Monotype composing and casting machines and small flat-bed printing presses enable Papworth to do its own printing. The directors of Papworth have shown full appreciation of the fact that the after-care of the tuberculous patient is to a large extent an economic problem.

Considerable interest was also shown by the visitors in the new surgical block: a number of the foreign delegates were present while Mr. H. P. Nelson was operating. The block is a self-contained unit of twenty-two beds, there being four wards of four beds each and the rest single rooms. The beds have specially divided mattresses for the nursing of chest cases. The unit is constructed on the most modern lines, and the internal decoration is a welcome contrast to the gloomy appearance of so many English hospitals. The floors are covered with rubber. In the *x*-ray room, which is adjacent to the operating theatre, an automatic device for changing casettes enables stereoscopic films to be taken: two films can be taken in less than six seconds.

There would seem to be considerable advantage in operating on chest cases in the country, under sanatorium conditions, and away from the fogs of large cities.

MODERN HOSPITAL CONSTRUCTION

In a Chadwick Public Lecture on this subject on April 2nd Mr. L. G. Pearson, F.R.I.B.A., said that concrete and steel construction provided special opportunities for the hospital designer; flush doors, chromium plating, numerous jointless materials, all seemed specially suitable for the treatment of the interior. With such a mass of new methods and materials it was interesting to review the situation in the light of first principles. Chadwick emphasized the importance of cubic air space and cleanliness in the design of hospitals, and his contemporaries, noticeably Florence Nightingale, revolutionized hospital planning in their day in order to attain these results. The work of Pasteur, Koch, and Lister carried the science of hygiene still further, but led to certain modifications. The fear of infection was much less as the result of their work, and the cubic capacity per patient in the standard type ward was now accepted at 1,000 cubic feet instead of 1,500 cubic feet. The floor space, on the other hand, remained at about 100 feet super, as this provided the necessary working space.

Changes in the Ward Unit

Taking the ward unit as the most important part of a hospital, to what extent had new ideas and methods changed the plan? With regard to aspect, the axis of the ward had usually been north and south in the past, with windows both sides, but some authorities did not agree that this was the ideal. A new arrangement with beds "parallel" was especially suitable for an east and west axis. A still further development was the "side-lighted" ward opening off a corridor. This was much favoured on the Continent, and especially suitable for a south aspect. It might be described as a "hotel" type of plan, where a number of small wards were preferred and direct cross-ventilation was not a first consideration.

Cross-ventilation was considered gospel in the days of the mid-Victorian sanitarians, but was now regarded by some medical men as rather a fetish. However, ample light and ventilation in every part of a hospital meant cross-ventilation in some form or another, and fanlights, borrowed lights, and well-ventilated corridors were much to be desired, though unfortunately not always in evidence in some recent hospitals. Air-conditioning was another up-to-date system which had disadvantages from a practical standpoint and was not economical. Electric fans and ducts required constant attention if they were to be efficient, otherwise they became unsanitary.

The attitude towards "exposed" plumbing had undergone a change. Pipes were now usually in accessible ducts, and it was considered important to have a smooth external face and chance one's luck about the microbes in the ducts. The position of the sluice room in relation to the ward was a question of great importance in the plan. The mid-Victorians placed it in a tower disconnected from the ward by a cross-ventilated lobby. This had turned out not to be altogether satisfactory, as the tower shut out a certain amount of light and air from the ward and the cross-ventilation sometimes resulted in the smell of the sluice room being blown into the ward. The sluice room was now usually in the main line of the ward block at the service end, but must be separated from the ward at least by a ventilated lobby.

Steel and Concrete Buildings

The method of construction based on steel and concrete had so many advantages from a sanitary point of view that it would undoubtedly come more and more into use. It was fire-proof and vermin-proof, and gave the smooth, hard surfaces beloved by the sanitarian. But the problem of noise was a serious one in this connexion, and the brains of specialists were now at work to mitigate this nuisance. The rounded corner had proved a necessity where a high standard of cleanliness must be maintained, and a number of metal and tile sections of this type were now on the market.

Mr. Pearson said in conclusion that there were finer opportunities of carrying out the hygienic principles of Chadwick and the pioneers of the science in the present day than ever before, "provided that we are not prepared to swallow all the methods and ideas without first making a critical investigation."

MEDICAL SICKNESS, ANNUITY AND LIFE ASSURANCE SOCIETY

The annual meeting of the Medical Sickness, Annuity and Life Assurance Society was held in its new offices, at 300, High Holborn, W.C., on April 1st, with Dr. F. C. Martley in the chair.

In presenting the directors' report Dr. Martley said that he had again to congratulate the members on another good year. To show how the society was forging ahead he mentioned that during the last seven years the assets, which now stood at over a million and a quarter, had been doubled. The popularity of the society's permanent sickness contract had once again been demonstrated. There was a "record" increase of £10,000 on the year in premium income, which now stood at over £101,000. Some increase in claims had to be recorded on the other side, as well as a very small gross increase in expenses, though actually the expenses regarded as a percentage on the premium income had decreased. In the life and annuity account again the premiums had shown a similar rate of increase, and the premiums here stood at over £101,000, slightly exceeding for the first time the premium income in the sickness section. The total new sums assured were practically the same as the previous year, but the new premium income was higher, which meant in effect that members were entering more for what he termed the

proper kind of insurance—namely, whole life or endowment assurance—than for the cheaper form of family provision policies. For the first time a new fund made its appearance, in the shape of capital redemption account. The society took power some years ago to transact this type of business, which was very useful to members who did not require life assurance, but were desirous of redeeming leasehold property by a policy which gave them the total of their expenditure on such property at the end of a given term of years.

Loans for Purchase of Practices

Dr. Martley went on to say that the sums invested in loans for the purchase of practices had increased by £24,000. The board was always trying to improve its scheme by cutting down expenses and otherwise arranging matters so that the borrower might not find his load too heavy a burden. On loans that were granted and actually completed no legal costs or stamp duties would henceforth be paid by borrowers. Repayments of capital had also been arranged so as to ease the tax upon the borrower as far as possible in the early years.

After referring to the healthy condition of the society's investments and to other matters, including the steady increase of membership, now well over 8,000, Dr. Martley paid a tribute to the excellent work of the staff under the manager and secretary, Mr. Bertram Sutton.

The directors retiring by rotation, Dr. G. de Bec Turtle and Mr. Lancelot Bromley, were re-elected, and it was agreed to grant to the directors a gratuity of 500 guineas. The meeting approved a recommendation for the payment of an interim bonus at the same rate as the previous year on all with-profit policies for permanent sickness and accident insurance and life assurances becoming claims during the present year. A vote of thanks to Dr. Martley for his devoted labours as chairman of directors was carried on the motion of Sir William Willcox.

ROYAL MEDICAL BENEVOLENT FUND

This is the centenary year of the Fund, and a special appeal is being made: (1) For new subscribers to raise the annual income by subscriptions and donations to £20,000. An increase of £6,000 over the present income of £14,000 would enable allowances of £52 per annum to be made to medical practitioners and £36 per annum to dependants, instead of £40 and £26 respectively, as at present. (2) For special donations to create a fund from which larger grants can be voted (*a*) to very urgent and distressing cases; (*b*) towards training the widows and orphan sons and daughters of medical practitioners to enable them to be self-supporting. Cheques should be made payable to the honorary treasurer, Royal Medical Benevolent Fund, 11, Chandos Street, Cavendish Square, London, W.1.

At a recent meeting of the committee thirteen new applicants were assisted and forty-one grants were renewed to beneficiaries on the books of the Fund; in all £1,398 17s. 4d. was voted.

The following particulars of a few cases helped indicate the kind of work undertaken.

M.B., Ch.B., aged 27, who was responsible for the maintenance of his mother and two younger brothers, had been prevented from taking up a salaried post owing to being in hospital for an operation, and was without means. It was stated that if something could be done to lessen the weight of responsibility for the family it would act as a tonic for the patient. Fund voted £45.

L.R.C.P.I., aged 71, married. In 1935 the applicant had a severe illness, hemiplegia, which affected his speech and legs. Although improved in health he has great difficulty in obtaining employment owing to his deafness, speech, and age. He is earning 10s. a week, and is in receipt of the old age pension of 10s. a week. His wife was operated on in 1934, and is in a very weak state of health; she has the charge of a mentally defective daughter, and is endeavouring to augment her income by taking lodgers. Fund voted £40 per annum to the doctor and £26 to his wife.

Widow, aged 67, suffering from pernicious anaemia, has been operated on for cataract and has lost one eye. On the death of her husband in 1936 she was left with her daughter in great financial difficulties, the only asset being the possible sale of the practice for £400. Two sisters-in-law, both in very poor circumstances, have given all possible charitable assistance within their powers. Fund voted £26 per annum and a special gift of £10.

Widow, aged 33, left on the death of her husband with three children, aged 5 years, 2½ years, and 6 months, with a capital sum of under £2,000. The Ladies' Guild will help with education.

Daughter, aged 54, suffering from diabetes, has an income of £60 per annum. Fund voted £26 per annum.

CONFERENCE OF OVERSEA MEDICAL OFFICERS

It is proposed to hold the annual conference for medical officers in industries over-seas on Thursday, July 16th, at the London School of Hygiene and Tropical Medicine, in order that medical officers on leave from the Tropics may be able to meet their colleagues and discuss their problems. The main subject for discussion will be the prevention of disease—for example, control of malaria and epidemic diseases in the Tropics, water supplies, sewage and refuse disposal, housing, the keeping of records, and hygiene generally. Medical officers practising on plantations, mines, railways, hydro-electric and construction schemes, and development companies generally are invited to attend. Government health officers will also be welcome. Those who are able to attend should apply as early as possible to the organizing secretary, Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.

The Services

DEATHS IN THE SERVICES

Major-General James Barnett Wilson, C.B., C.M.G., late Army Medical Service, died at Broughshane, Antrim, on April 1st, aged 73. He was born on June 17th, 1862, the eldest son of Mr. William Orr Wilson of Knowehead, and was educated at Queen's College, Belfast, where he graduated M.D. of the Royal University of Ireland in 1883, and at Edinburgh University. Entering the Army as surgeon on January 30th, 1886, he became colonel in the long war promotion list of March 1st, 1915, major-general on May 30th, 1918, and retired in 1921. He served in the Tirah campaign on the North-West Frontier of India in 1897–8, in the Malakand and Buner, was present at the attack and capture of the Tanga Pass, and received the Frontier medal with clasp. In the South African War, in 1901–2, he took part in operations in Cape Colony, the Orange River Colony, and the Transvaal, and received the Queen's medal with five clasps. He served in Egypt from 1904 to 1909, and was principal medical officer in Jamaica from 1912 to 1914. He served throughout the war of 1914–18, in France and Flanders, in 1914–17 as A.D.M.S. successively of the 1st Cavalry Division, of the 27th and 56th Divisions, and in 1917–18 as D.D.M.S. of the 18th Army Corps. On February 21st, 1918, he was appointed D.D.M.S. of the Aldershot Command, and on March 5th, 1920, of the Southern Command in India. He was mentioned in dispatches in the *London Gazette* of January 1st, 1916, of June 15th, 1916, and of December 24th, 1917, received the C.M.G. in 1916 and the C.B. in 1918, also the French Croix de Guerre and the Belgian Order of the Crown. In 1895 he married Kathleen Dorothea, daughter of Captain David Aird, R.N., and leaves two sons, Captain J. B. Wilson, R.E., and Captain D. A. O. Wilson, R.A.M.C.

Lieut.-Colonel Francis Edward Gunter, D.S.O., R.A.M.C. (ret.), died at Rochester on April 2nd, aged 66. He was born on May 18th, 1869, the eldest son of Lieut.-Colonel Edward Gunter, and was educated at Dover College and at Edinburgh University, where he graduated M.B., C.M. in 1893, having previously taken the Scottish triple qualification in 1891, and subsequently proceeded to the M.D. degree in 1923. After filling the posts of assistant house-surgeon at the Devonshire Hospital, Buxton, and of clinical assistant at the West End Hospital for Nervous Diseases, he entered the Army as surgeon lieutenant on July 29th, 1895, became lieutenant-colonel on March 1st, 1915, and retired on September 24th, 1919. He served throughout the war of 1914–18, acting as temporary colonel and A.D.M.S. of a Division in 1916, was mentioned in dispatches in the *London Gazette* of August 6th, 1918, and received the D.S.O. in 1917. After his retirement he settled in London, where he was physician to the Margaret Street Hospital for Consumption and Diseases of the Chest. He was twice married, and had a son and a daughter by his first wife.

England and Wales

British Post-Graduate Medical School

The following lectures will be delivered at the British Post-Graduate Medical School, Ducane Road, W.:—In the Department of Medicine: six lectures on non-tuberculous pulmonary diseases, by Dr. R. A. Young, C.B.E., on May 21st and 28th and June 4th, 11th, 18th, and 25th, at 3 p.m. In the Department of Surgery: six lectures on surgical tuberculosis, by Sir Henry Gauvain, on May 7th, 14th, 21st, and 28th, and June 4th and 11th, at 2.30 p.m. In the Department of Obstetrics and Gynaecology: eleven lectures on recent advances in gynaecology, on Mondays at 3.30 p.m., from April 20th to July 6th (except June 1st). These courses are for regular students of the School, but a limited number of tickets are available, without fee, to other medical practitioners. Applications should be addressed to the dean by April 14th for the course on recent advances in gynaecology, by April 27th for the course on surgical tuberculosis, and by May 11th for the course on non-tuberculous pulmonary diseases.

Midwives Bill: Administration of Service in London

Under the Midwives Bill now before Parliament[1] the duty is placed upon the local supervising authority under the Midwives Acts to secure an adequate service of certified midwives, and this it may do by making arrangements with welfare councils or in other ways. A "welfare council" is defined as a council, not being an authority within the meaning of the intended Act, which has established a statutory maternity and child welfare committee. In London these councils would be the City Corporation and the metropolitan borough councils. The Corporation and twenty-three of the borough councils are in favour of the duties being undertaken by them, while the other five consider that the authority should be the London County Council. The County Council, through its Hospitals and Medical Services Committee, has already expressed the view that it should be the body to administer the service, especially as it is also the hospital authority and has, in addition, other functions relating to maternity work. It is considered highly desirable that a municipal midwifery service should be closely linked with the arrangements for the provision of hospital accommodation for patients for whom this is necessary. The advantages of a large—that is, of a county—service are manifest, in that it would attract better applicants than would a small one; there would be uniform rates of pay and conditions of service throughout London; the fluctuating needs of different areas would be better met; the needs for training medical students and pupil midwives could be envisaged and provided for London as a whole; and the cost would be equitably distributed over the county. It would, of course, be necessary to co-ordinate the service closely with the maternity and child welfare work of the metropolitan borough councils, and in carrying out its obligations the L.C.C. would frame and administer its scheme after the fullest consultation and in co-operation with them. The Midwives' Institute strongly contends that the supervision of midwives should lie with the larger authority, and hopes the County Council will resist all attempts to induce it to delegate to borough councils its responsibility for all midwives doing domiciliary practice in London. On some other matters in the Bill the Hospitals and Medical Services Committee and the Finance Committee of the L.C.C. urge that the unit cost—that is, the estimated average net annual cost of employing a midwife—for the calculation of Exchequer grant should cover all expenses of each authority, and, if necessary, be separately calculated for different authorities. The unit cost in London is likely to be considerably more than the average for the country generally, and the "unit" cost for the purposes of the grant in respect of London should be determined in accordance with London experience. It is also the view of the committees that the Bill should provide for a guaranteed minimum Exchequer grant of 50 per cent. of the approved expenditure of local authorities on the new service for at least ten years. On the basis proposed in the Bill the Council would receive a grant of only about 30 per cent. of the expenditure imposed during a five-year period. While not objecting to compensating midwives who may be required to retire from independent practice, the committees hold the view that the Council should not be obliged in all cases to grant compensation on so high a basis as five years' emoluments, and the question of compensating midwives who voluntarily retire should be discretionary on the part of the local supervising authority. The London County Council is approaching the Minister of Health during the present week jointly with the Association of Municipal Corporations and the County Councils Association to put before him its views on the question of the Exchequer grant.

[1] *British Medical Journal*, March 28th, p. 655.

Maternal Mortality in Hammersmith

Dr. J. B. Howell, medical officer of health for Hammersmith, has reported to the borough council that in the year 1935 only one maternal death was registered in Hammersmith, giving a rate of 0.5. The 1934 figure for London was 2.7, and for England and Wales 4.42. Dr. Howell added that he was doubtful whether this particular case should have been counted as a maternal death as it occurred after an abortion at three months of pregnancy and not after the birth of a live child. The patient was stated to have had a fall, which caused the abortion. She was at home under the care of a medical practitioner for four days, and then removed to Hammersmith Hospital, where she died two days later. Whilst on this point, Dr. Howell drew attention to the comparatively large number of abortions which took place, many of them self-induced or procured by some other person. The only cases which were known were those which proved fatal or resulted in serious illness. A further interesting point about these cases was that whereas formerly most of the women were unmarried, the abortions now occurred in increasing numbers among married women.

France

[FROM OUR CORRESPONDENT IN PARIS]

Resurrection of the Académie de Chirurgie

For many years past French surgeons have satisfied themselves with nothing more ambitious or pretentious than the Société Nationale de Chirurgie. Recently, at the Sorbonne, in the presence of the President of the French Republic and a distinguished gathering, the resurrection of the old Académie de Chirurgie was celebrated. Its origin dates from an edict by Louis XV, its motto being: "Vérité dans la science, moralité dans l'art." The Convention destroyed the Academy, and when it came to life again in 1843 it assumed the more modest title of Société Nationale de Chirurgie. It was on November 29th, 1935, that the decree giving birth to the new Académie de Chirurgie was signed. Professor Gosset's address at the Sorbonne was a retrospect, in the course of which he pointed out that all the academies suppressed in 1793 promptly came to life again with the notable exception of the Académie de Chirurgie. Why? Its achievements had been distinguished and its future most promising. Professor Gosset's answer was: internecine strife. It must have been galling for the surgeons in 1820 to see the physicians succeed in reviving the Académie de Médecine, whose doors were opened to the surgeons in a parsimonious spirit. The new Académie de Médecine, with a membership of 120, had only sixteen seats to offer the surgeons, who must have received meagre consolation from the reflection that quality is often inversely proportional to quantity. The new Académie de Chirurgie will not only have titular members, but also forty associate members, twenty of whom will be chosen from the ranks of pure science. Already d'Arsonval, Leclainche, Béclère, and Regaud have been invited to fill four of these seats.

Assemblée Française de Médecine Générale

Anglo-Saxons with a perfunctory view of the Latin mentality are inclined to plume themselves on their genius for team work, and to thank that benign Providence which has not doomed them to the egotistical individualism of their neighbours. But what is perhaps the most striking fact about French medicine during the last few years is the success with which French doctors have pulled together, not merely in defence of their personal interests but also for the advancement of science. Four years ago Dr. Henri Godlewski translated into action his dream of a federation of clinicians—the pooling of the hitherto almost entirely neglected experiences of general practitioners. During the past four years more than 600 medical meetings have been held under the auspices of the Assemblée, and the information collected and sifted locally has been the subject of nearly a score of central meetings at the Hôtel-Dieu in Paris. For the past year the practice has been to associate each of these central meetings with an Assise du Souvenir devoted to some historical subject and personality. The twentieth session of the Assemblée, held on March 1st, was presided over by Médecin Général Inspecteur Rouvillois. The subject for discussion, already debated in the provinces, was the fixation abscess. The Assise du Souvenir centred about the Val-de-Grâce military hospital and the distinguished names associated with it. The next discussion will be devoted to the late results of operations for chronic appendicitis. The findings of the local meetings will be presented for discussion at Nice on April 5th and 6th, when the members of the corresponding Italian Assemblée will be invited to take part in the discussions. On May 21st Laennec will be the subject of an Assise du Souvenir.

Why not Special Medical Tribunals for Medico-Legal Actions?

Dr. A. Besredka of the Pasteur Institute has recently returned to it after taking part, in the North of France, in a lawsuit presenting some curious features. The plaintiff was the widow of a miner operated on by the defendant. Spinal anaesthesia was preceded, as usual, by a subcutaneous injection of adrenaline in the thigh. Only a few hours after the operation signs of gas gangrene appeared at the site of the injection of the adrenaline, and in less than thirty hours the patient was dead. Listening to the proceedings Dr. Besredka was astonished to note that the barristers and even the *procureur* became so tied up in their physiology, pathology, and bacteriology that they were inclined to attribute the death to the spinal anaesthesia and not to the injection of adrenaline! Dr. Besredka's proposed remedy for such a quaint state of affairs is the constitution of an exclusively medical tribunal for dealing with medico-legal cases.

René Leriche and his Novocain Treatment

Many, if not most, Frenchmen when asked to name the French surgeon who has done most to enrich surgery during the past generation would have no hesitation in selecting René Leriche of Strasbourg. His researches bearing on the sympathetic system may have more interest for his fellow surgeons than for general practitioners, but they in their turn have benefited enormously by a procedure which is as simple as it seems to be generally applicable. It is the infiltration of the tissues about some painful spot, sprain, or other lesion with novocain. Leriche's explanation of the dramatic effect of this procedure is that it blocks reflexes responsible not only for the pain, but also for the oedema, limitation of movement, and other phenomena familiar to all who have to treat the aches and pains of humanity. The first time this system was applied was in 1928, when an instructor in fencing who suffered from an epicondylitis was promptly and permanently cured by a couple of injections. Since 1929 hardly a day has passed at the Leriche Clinic without the application of this treatment, the wonderful results of which are revolutionizing our conceptions of the origins of certain diseases. All the post-traumatic juxta-epiphysial algias, all algias from injuries to the foot, the hand, elbow, and shoulder, and many of the algias of the knee disappear at the first injection. Fractures also respond satisfactorily; and recently, in conjunction with Fontaine, Leriche has shown that angina pectoris, asthma, and arteritis are also amenable to this treatment. The advice Leriche gives to general practitioners may be summed up as follows: "If they wish to take the trouble to analyse, syringe in hand, the symptoms they encounter every day, they will be surprised by the degree of the functional element disclosed by infiltration with novocain, and they will experience some surprising therapeutic results." (*La Presse Médicale*, January 15th, 1936.) What a fortune Leriche could have made if, instead of confiding his discovery to every general practitioner capable of wielding a hypodermic needle, he had set up in Paris as a pain-killer, function-restorer, and the apostle of a brand-new system of therapeutics, with his novocain discreetly kept in the background!

Reports of Societies

NASAL DISCHARGE IN CHILDHOOD

At the tenth ordinary meeting of the Midland Medical Society, with Professor WYNN, the president, in the chair, Mr. BRAYSHAW GILHESPY read a paper entitled "Nasal Discharge in Childhood."

The association of this condition with the presence of tonsils and adenoids, and also the close relation between nasal discharge and otological complications, were dealt with, the latter being especially liable to occur with adenoids around the Eustachian opening. Until the present century this condition had been considered to be due entirely to infected tonsils and adenoids, but Dean in America and Watson-Williams in this country had pointed out that the removal of tonsils and adenoids by no means cured all cases. Mr. Gilhespy said that some years ago he had published the analysis of fifty cases, which revealed that the ethmoidal sinuses and the antra also were frequently infected; this should be borne in mind if improvement did not follow tonsillectomy and adenoidectomy. In many cases persistent rhinorrhoea was due to incompletely removed tonsils and adenoids. The danger of the condition was the occurrence of repeated upper respiratory infections, sometimes leading to bronchiectasis. Case histories were given to illustrate the early origin of nasal discharge, often in the first year of life. The speaker suggested that the earlier and more frequent incidence of ethmoiditis as a factor in this condition was more important than had been hitherto appreciated. Treatment included, from the surgical point of view, the removal of tonsils and adenoids, antrum washouts, the treatment of infected ethmoid sinuses and of deflected septum, and, from the medical point of view, ionization, the electro-cautery, silver packs (glycerin and argyrol), diastolization, and change of air. Mr. Gilhespy had recently reviewed a second series of seventy-five cases which conformed closely with his earlier group.

Mr. E. C. N. STRONG mentioned cases supporting Mr. Gilhespy's contentions, and also discussed the anatomy of the sinuses and antra, stressing the problems of drainage. Dr. H. EBBS presented figures of a large series of consecutive post-mortem examinations on children under the age of 2 years illustrating the frequency of sinus infection. He added that this work, which had been commenced by the late Dr. Gittins, would be published when the series had reached 1,000 cases.

Professor K. D. WILKINSON, opening the general discussion, stated that he classed chronic nasal discharge in childhood as important and dangerous, because it might lead to asthma or repeated upper respiratory infections. It was apparently infectious, for it certainly spread from one member of a family to another, and the patient should therefore be isolated. The tonsils, adenoids, antra, and sinuses should be considered, but these cases were unsatisfactory to treat, and often a complete change of air and regime was the only efficacious remedy. Dr.

WINFIELD declared that he had never seen a case improved by surgery. Mr. STIRK ADAMS agreed that surgical treatment was often unsatisfactory. He thought that the dust of the towns prevented recovery, and that it was all-important to remove the child from town air and to ensure proper diet and routine. The PRESIDENT commented on the great importance of Dr. Ebbs's observations. He pointed out that catarrhal infections in infancy tended to be generalized rather than localized, and that a catarrhal infection of the throat or nose would be likely to involve the linings of the adjacent paranasal sinuses at the same time. He urged preventive measures, such as the wearing of a mask by a mother suffering from a cold in the head, and excluding others who had colds.

GAS-AIR ANALGESIA

At a meeting of the Liverpool Medical Institution, held on March 19th, with the president, Mr. G. C. E. SIMPSON, in the chair, Dr. R. J. MINNITT read a paper on "Gas-air Analgesia: Obstetrical, Surgical, Dental."

Dr. MINNITT described the advance that had taken place since February, 1934, when he read his first paper on the subject. Since then many thousands of patients had had the benefit of gas-air analgesia, and nearly four hundred gas-air machines were being employed in various parts of the world.

Use in Obstetrics

He gave an analysis of 1,025 cases conducted in the Liverpool hospitals during 1933–5, and compared the findings with the investigation made by the British College of Obstetricians and Gynaecologists. There was very little difference. He answered criticisms of the report regarding weight and bulk of the apparatus presenting difficulties in domiciliary practice by describing a midwives' model, which weighed 15 lb. without the cylinder. It was shown that the expense of the nitrous oxide could be minimized by preventing leakages. In cases he had conducted the amount of gas used was approximately 25 gallons per hour.

Attention was drawn to important points in the technique of administration, the fact being emphasized that, as labour was accelerated by the use of gas and air, in those cases where it appeared to be retarded an obstetric cause should be sought.

The apparatus had been introduced into the wards of the David Lewis Northern Hospital, Liverpool, for the purposes of analgesia for painful dressings with very great success. Instances were given, and Dr. Minnitt suggested that it should be provided in the out-patient department of every hospital. The apparatus had been adapted for use in the preparation of painful dental cavities, mention being made of a demonstration in March, 1935, in Guy's Hospital, London, by Dr. Kenshole, L.D.S., who thought that the method had a limited application in dentistry but might prove a godsend to those patients who were not suitable for local anaesthesia. Dr. Minnitt showed a cinematograph film demonstrating the uses of the apparatus in obstetrical, surgical, and dental cases.

Discussion

In the discussion which followed, Miss NICHOLSON said that obstetricians were most grateful to Dr. Minnitt for the amount of work and care he had expended in producing a good analgesia during labour. That he had done so was shown by the fact that in the recent investigation by the College of Obstetricians and Gynaecologists of the various methods of inducing analgesia Dr. Minnitt's was the only one found to be safe and efficient for the use of midwives. Dr. JOHN GRAHAM said that he had used a Minnitt gas-and-air apparatus for about a year. Most patients were enthusiastic, pain was greatly relieved, and noise was very much less, relations consequently being much less troublesome. The machine was quite easily portable, supplies of gas were easily obtained, and the speaker's average cost was about six shillings per case—that is, using about 15 to 25 gallons of gas per hour. A midwife with no previous experience has used the machine quite satisfactorily on several occasions after a few minutes' explanation. He thought that the cost would be very greatly increased by leakages of gas, but this was very easily obviated by the judicious use of the spanner provided. He hoped that the day might never come when he would have to conduct midwifery cases without gas-and-air analgesia.

Dr. A. WINFIELD said that having used Dr. Minnitt's apparatus on some fifty or so cases, and having found it efficient for producing analgesia in a good proportion, he always carried it. Low forceps delivery of multiparae had been performed without pain, and primiparae had been delivered without operative intervention with great diminution, if not always absence, of pain. This had been effected by blocking some of the air inlets to increase the concentration of nitrous oxide during the last few pains, and the speaker felt that, in his attempt to make an apparatus safe when used by people of no experience in the administration of anaesthetics, Dr. Minnitt had sacrificed a good deal of flexibility. An attempt to use the apparatus for small repairs of the perineum had not met with much success.

Chronic Empyema

Mr. JOHN T. MORRISON read a paper on "Some Experiences with Chronic Empyema." He dealt first of all with the treatment of closed cases, in which the diagnosis had been missed, along the lines of airtight drainage and general medical treatment, alluding, in particular, to the use of the respiratory exercises devised by McMahon. He then discussed the type in which a persistent sinus was present, and pointed out that in the great majority of cases this was due to an imperfectly drained cavity. The unique position of x rays in diagnosis was here stressed, and illustrations were given of the unexpected extent of the disease demonstrated in many cases by lipiodol injection. Operative treatment was described in some little detail, in regard both to principle and to practice. The place of phrenic interruption was mentioned in the treatment of basal cavities, and, finally, examples were quoted to show the applicability of various methods to different types of case.

In closing, Mr. Morrison referred to the treatment of tuberculous empyema. Full recognition was given to the value of the more conservative procedures, but operation was urged in the more localized cases at an early date. In the more extensive cases operation was also indicated provided the patient's condition could be made reasonably satisfactory. The great risks in cases not operated on of perforation into a bronchus or through the chest wall were emphasized, and the extremely bad prognosis of cases in which secondary infection developed as a result of either of these catastrophes.

EAR, NOSE, AND THROAT OPERATIONS: A CRITICAL SURVEY

At a meeting of the Brighton and Sussex Medico-Chirurgical Society held on April 2nd, Mr. HAROLD SEYMOUR in the chair, Mr. D. A. CROW read a paper entitled "A Critical Survey of the Commoner Ear, Nose, and Throat Operations."

Stress was laid on the importance of paracentesis in acute otitis, but it was not found advisable to do it in less than twenty-four hours from the onset of earache. Panicky surgery in regard to mastoid abscess was deprecated and the strong opinion expressed that no mastoid should be opened in less than a week from the commencement of ear trouble, owing to the severe reaction and septicaemia which might follow the opening up of tissues in the early stage of inflammation. But, on the other hand, no ear discharge should be allowed to go on for more than eight weeks without a cortical operation, which measure would prevent the occurrence of chronic otorrhoea. An analysis of a questionary to 500 patients who had undergone tonsillectomy was presented; 60 per cent. of these patients stated that they had received benefit, but the need was stressed for a more balanced judgement regarding these cases.

Mr. Crow maintained that, in spite of folk-lore pathology, the stimulus of cold was the best protection against catarrhal conditions of the nose and throat, and that an unhealthy state of nasal engorgement was often set up in childhood by overclothing; this gave rise in later life to chronic catarrh and sinusitis. The expression "catching a chill" was a disgrace to scientific medicine; if it meant anything, it meant that a patient felt chilly, which is obviously the first symptom of a mild septicaemia. To ascribe the *cause* of such an illness to cold or a chill is as reasonable as to say that because abdominal pain is one of the first symptoms of appendicitis, therefore appendicitis is caused by abdominal pain. The diagnostic term thus conveys a false aetiological significance to the detriment of the patient. The too frequent performance of septal correction was criticized, and arguments were presented to show that the only really favourable results of surgery in connexion with the nasal sinuses were when operation was performed in the subacute stage.

CORRESPONDENCE

Erythrocyanosis

SIR,—I read with much interest the article by Professor Telford and Mr. Simmons (*Journal*, March 28th, p. 629). It is clear that the writers have obtained very gratifying results by means of bilateral lumbar cord ganglionectomy, but before resorting to surgical measures it seems to me that a thorough trial should first be made of medical treatment.

During the past year I have had two cases of this condition under my care at the Bristol Royal Infirmary, and both have been greatly improved by injections of acetylcholine bromide ("pragmoline B") in association with other measures.

The first, a woman of 27, had a condition typical of that described as "erythrocyanosis crurum puellarum," there being the usual reddish-blue discoloration of the skin in the lower part of the leg, together with some coldness and swelling of the ankle. She responded to treatment as well as the more interesting case.

This was a woman of 47. When I first saw her she had had months of drug treatment combined with physiotherapeutic measures, despite which her condition had steadily become worse. The hands and forearms were reddish-blue, clammy, and cold, and there were many nodules, as well as some scarring, on the wrists and hands. Here and there some of the nodules had broken down to form small ulcers, so that on first inspection one had to consider the question of a tuberculous skin condition. The lower part of the right leg, including the foot, was reddish-blue and cold, and there was some slight oedema over this area The big toe was in a pre-gangrenous condition, being anaesthetic, blue, and cold, as well as having a small patch of necrosis at the base of the nail.

Daily subcutaneous injections were commenced at once of pragmoline B, first in doses of 1/4 c.cm., which were gradually increased to 1 c.cm. The response was immediate, so that at the end of two weeks the injections were given every other day, and at the end of three weeks they were further spaced to every third day. At the end of six weeks no further treatment was required, as the condition of the skin and circulation had become, to all intents and purposes, practically normal.

Other treatment (including the wrapping of the foot in a thick layer of brown wool, and the wearing of a broad felt slipper, massage, ultra-violet light, diathermy, and postural exercises) was continued, as before, with the application for two weeks of a warm ichthyol-calamine-witch-hazel lotion, and the avulsion of the toe-nail, as the necrotic patch extended under its bed. At the end of a period of treatment the patient finally agreed to have five remaining front teeth removed as the gums were badly affected with pyorrhoea, and it was thought that this might act as a contributory factor.

Apart from the "erythrocyanosis" the patient appeared to be normal. Pulsation in the vessels of the foot was unaltered, and there was no evidence of arteriosclerosis, or of any disease of the central nervous system. Her case illustrates what has been described by other writers—namely, the close relationship which exists between conditions of vascular spasm such as "erythrocyanosis," Raynaud's disease, and "erythromelalgia." Cases of the latter condition have been known to develop in the chronic stage into a condition which is typical of erythrocyanosis.

Acetylcholine was first used clinically in 1926 by Villaret and Justin Besançon in the treatment of Raynaud's disease, and has since been widely used in similar conditions. It is quite safe when given as above, but should never be given intravenously. Excellent results have also been recorded with non-specific protein therapy, especially with T.A.B. vaccine, in the treatment of these conditions.—I am, etc.,

Bristol, April 1st. FREDERICK SUTTON, M.D., M.R.C.P.

SIR,—I found the article on erythrocyanosis in your issue of March 28th (p. 629) very interesting. During the last six years many cases of this type have come my way, though not so severe as those mentioned in this article. No treatment other than operation is mentioned by Professor Telford. Having been unable to discover any details in the ordinary textbooks available to me, I was forced to work out a theory (it was a "local vascular" one) and a plan of treatment for myself.

I found that in most cases a more normal appearance was soon produced by:

1. Loosening tight garters and all tight "bands" above and below the knee;
2. Warmer stockings or two pairs, the silk ones, to gratify the usual desire for appearance, on the outside;
3. Thyroid in graduated doses, until the weight or pulse was affected;
4. Injections of calcium and vitamin D; and
5. Leg exercises, such as walking or skipping, with local massage.

One could watch the area involved grow less cyanotic and the circulation becoming more rapid every week. Persistence in the above treatment generally gave an excellent result.—I am, etc.,

Cornwall, March 31st. W. H. PALMER, M.B., B.S.

Glycosuria of "Lag Storage" Type

SIR,—In view of the interest which has been aroused by Dr. R. D. Lawrence's article in your issue of March 14th (p. 526) on glycosuria of "lag storage" type, we would like to report that during the past year we have been carrying out glucose tolerance tests on patients, diagnosed clinically as peptic or duodenal ulcer in the medical wards of the Seamen's Hospital. Our results are in agreement with Dr. Lawrence's findings and with those of Dr. Cammidge, who in 1921 noted the association of this type of curve with hyperchlorhydria.

We have been able to demonstrate without exception the so-called lag type of storage curve as described by MacLean—that is, normal fasting level, a steep rise to values of 0.2 per cent. and 0.3 per cent. within the first three-quarters of an hour, and a return to the original fasting level within two and a half hours.

In all cases the estimations were made from finger-prick (arterial) blood. Glycosuria was only present during the hyperglycaemic period. We believe this abnormal response to 50 grams of glucose to be a question of absorption, but further than this we are not prepared to go as our investigations are not yet complete.—We are, etc.,

EILEEN A. BOYD.
ARTHUR DAVIES.

Devonport Pathological Laboratories, Greenwich, S.E., March 31st.

Anorexia Nervosa

SIR,—I wish to give nothing but thanks to your reviewer for the kind way in which he has dealt with my book (*Journal*, April 4th, p. 697), but I confess that I am surprised that he should think there must have been some recent advance in the treatment of anorexia nervosa. This is the one neurosis where, so far as I am concerned at least, there has been no change. I have continued to use the methods which I was taught by the late Dr. Williamson of Ventnor, whose assistant I had the great good fortune to be for some years at the beginning of this century. He used the methods described for the treatment of nervous exhaustion by Weir Mitchell, in his book *Fat and Blood*, published some seventy years ago. From these methods I have deviated hardly at all.

I certainly thought that it was common knowledge that this treatment scrupulously carried out was almost a sovereign remedy for this neurosis, and that the trouble about it was (*a*) that the condition is often overlooked, and (*b*) that, when it is recognized, as soon as the parents know that there is no organic disease they think that the treatment can be carried out at home. In cases of any severity, however, this is very difficult indeed, and these patients, therefore, are often allowed to drift into grave ill-health.

It should be noted that Weir Mitchell employed not only physical measures but also active common-sense psychotherapy, a fact which is often overlooked, though it is there in his book for all to read. It may also be said that this book is probably the shortest important book in medical literature, and that it is easy to understand.—I am, etc.,

London, W.1, April 4th. T. A. ROSS.

Nutrition, Acute Rheumatism, and Tuberculosis

SIR,—Professor Ritchie in his interesting address on "A Crusade against Acute Rheumatism" tells us that "the two diseases [acute rheumatism and tuberculosis] resemble each other in several respects. Bad environment and malnutrition are important factors in the causation of both diseases." This statement confirms what I have written in my book: "It is from the class of acid children that all the patients who suffer from acute rheumatism and tubercular disease are derived." The "acid class" is composed of those children in whose food the acid-base balance is moved too much towards the acid side, and it is only by reducing the members of this class that we can hope to prevent an increase in the prevalence of these two diseases.

It is not the quantity but the quality of food that counts for successful nourishment. The calorific content of the food may be satisfactorily high, but if the basic reserve be wanting the results cannot be good. Until this point is fully accepted by the medical profession as a whole it is useless to expect anything but a steady increase in the numbers of children who fall victims to either acute rheumatism or tuberculosis.—I am, etc.,

Swansea, April 5th. G. ARBOUR STEPHENS.

Medicines and Appliances Bill

SIR,—As one who attended the discussion in the House of Commons on the Medicines and Surgical Appliances (Advertisement) Bill I should like to make a comment on the letter of Dr. Manson on this subject. With his usual kindliness he suggests excuses for Members of the House—namely, that the count may have been due to some of them having an urgent call (not too obviously connected with their Parliamentary business) in the neighbourhood of Liverpool; or that perhaps many had gone to lunch, at which they could not be disturbed. As to the first, it was observed early in the discussion that the attendance was good for a private members' Friday—there must have been at least a hundred in the House at one time. As to the second, let me tell him that I was the disgusted spectator of successful attempts made by several Members to induce others to refrain from going into the Chamber in response to the call. What reasons they gave I don't know, but these same Members had just previously been cheering references to the inadequacy of the law which permits the abuses which had been exposed, not only by the supporters but by the opponents of the Bill. But, perhaps they were *ironical* cheers. An ingenuous citizen naturally expected that after this all parties would be determined to see that *something* was done to remedy the abuse, but the ingenuous citizen doesn't understand the business methods of the House. It was a sorry spectacle, and left at least one observer with a poorer opinion than he had previously held of the public spirit and intelligence of our legislators.

Our sympathy and thanks are specially due to Mr. Duckworth and Captain Elliston, who put up a very good case. The latter, in addition, had devoted to the cause much hard preliminary work, and, backed by the support he had from many organizations, including the Press and advertising world, had good reason to expect a better result.

I confess I see no hope for legislation on an evil which was more scathingly denounced than anything of the kind I remember in my experience, by a Select Committee of the House itself. It would appear that Parliament, which finds time every day almost to restrict individual initiative in many ways, has either no time or no inclination to deal with the cruel exploitation of large numbers of ignorant people, but prefers to take the cynical view that the fool and his money are best parted. It is no use saying that the Bill didn't go far enough, or was wrongly drafted—that could have been remedied by giving it a second reading and sending it to a committee.—I am, etc.,

London, W.1, April 6th. ALFRED COX.

The Midwives Bill

SIR,—The new Midwives Bill will, when it becomes law, bring about two much-needed reforms in domiciliary midwifery practice—the prohibition of maternity nursing by "handywomen," and an improvement in the status, working conditions, and income of the midwife. The effect of these reforms in reducing maternal mortality and morbidity will, however, be greatly enhanced if an effort is made, simultaneously with their introduction, to extend and develop "home-help" schemes, at charges within the means of working-class women.

The Maternity and Child Welfare Act, 1918, gave local authorities the necessary powers to organize "home-help" schemes, but in many districts it has proved very difficult to run such schemes in competition with independent "handywomen." With the coming into force of the Midwives Bill there will be an excellent opportunity of incorporating erstwhile "handywomen" as "home helps." I do not believe it will be found difficult to ensure that these women do not undertake duties which properly belong to the midwife if they are organized in a scheme under the local authority. On the other hand, their experience will help to overcome the natural objection of working-class women to having a stranger "poking about" their kitchens.

A good deal of maternal morbidity is due to the inability of the working-class mother to carry out our instructions regarding rest, etc., during pregnancy and the puerperium. The difficulty of obtaining domestic help is one of the reasons why an increasing number of women are going into hospital for their confinements. Only by improving home conditions will this trend be discouraged.—I am, etc.,

Helen M. Jardine, M.B., Ch.B., M.M.S.A.

Leyton, April 2nd.

A Record Card for the Retired?

Sir,—It is common knowledge that certain towns in the country—many of them on the South Coast—are regarded as purely residential areas. This means that many business and professional people decide, on reaching the age of retirement, to leave the town in which they have spent the greater part of their lives, and to migrate to one of these resorts for the period of their retirement. Sooner or later these people have to consult a practitioner who knows nothing of their previous medical history. On making an examination for the purpose of diagnosis it not infrequently happens that evidence is found of a surgical operation. On asking the nature of the operation we are quite often met with the reply, "I do not know."

My object in writing is to suggest that some means should be devised whereby the medical history of a patient should be available for any future practitioner who may have charge of the case. When an operation has been performed the patient should be given a written statement such as is at present only sent to the practitioner at that time in attendance.

It is not necessary to stress the urgency of some means to this end being devised. Obviously there may not be time to communicate with the medical practitioner referred to by the patient, and we are faced with the necessity of making a diagnosis "in the dark," and the possibility of making a mistake which with fuller knowledge might have been avoided.—I am, etc.,

Hastings, April 2nd. J. S. Farnfield.

Recruitment of Medical Men in a National Emergency

Sir,—In the *Journal* of March 28th (p. 667) appears a letter from Dr. Harry Boyde drawing attention to the fact that many of our colleagues are prepared to throw their weight behind those forces making for peace and against those making for a world catastrophe. Surely this statement should apply to the bulk of a profession which, both reasonably and emotionally, is on the side of preserving life. Would it be too much to demand that all those of us who co-operate in preparing to deal with the results of war should spend at least an equal amount of time and thought and energy in efforts to prevent war? Our attention has been drawn to the doctors' protest against the bombing of the Red Cross units in Abyssinia; having signed that protest there must be other constructive ways in which the medical profession can co-operate to fight the menace of war.—I am, etc.,

London, N.W.1, March 30th. Cecile Booysen.

Sir,—I have read the interesting letter of Dr. Harry C. Boyde in the *Journal* of March 28th. I must confess that I do not take such a hopeless view of the international situation as his letter would imply, and while I am quite prepared to admit the difficulties of the correct diagnosis of the causes of war, I believe (to quote his own argument) that just as the preventive side of medicine is as important as the curative aspect in civilian life, so the same reasoning holds good in the preliminary training of civilian medical practitioners before any possible sudden national air emergency.

Manifestos by individuals, public bodies, or even Governments are more or less useless as a practical deterrent to a would-be air aggressor, as shown by recent history and the action of our own Government itself. After pursuing a fifteen-years policy of unilateral disarmament our Government reluctantly comes to the same conclusions, hence the intensive speeding up in the expansion of the Royal Air Force, in conjunction with the air-raid precautions undertaken in collaboration with the St. John Ambulance and British Red Cross Society. Fortunately some of the local Divisions of the British Medical Association, realizing the importance of anti-gas training, have already held classes of instruction in this subject for their members.—I am, etc.,

J. B. Scott, *M.C.*, T.D.,
Lieut.-Colonel R.A.M.C.(T.).

Putney, S.W.15, March 29th.

Sir,—When war is inevitable I can quite easily conceive the medical profession having to deal seriously with the problem of how to preserve the financial interests of the doctors who volunteer or who are conscripted. But surely whilst war is not with us and is preventable the medical profession should use all its powers to help the millions of people who are against war. We are guardians of the health of the community, and should be more interested in organizing means for preserving it than in organizing to aid the forces which work for its destruction.

The doctors and the majority of the peoples, combatants of either side, gained nothing either materially or spiritually from the last war. On the contrary, the loss in manpower and spiritual values was enormous. With modern means of mechanical and chemical warfare it has been estimated by experts that the next world war will probably bring with it the destruction of civilization. When we realize this our concern as doctors cannot be our own financial interests, it can only be the preservation of civilization.

Can a war be waged without doctors? Can a war be waged without engineers? These are the problems that confront us, and we must seek their solution in a practical way after wide discussion in our Association for the organization of peace.—I am, etc.,

London, N.19, April 4th. S. Leff, M.B., B.S.

Anthropophobia

Sir,—The interesting letters of Dr. Bentley (*Journal*, March 21st, p. 610) and Dr. A. J. Brock (April 4th, p. 724) give food for thought. There evidently is something the matter—"Kali the Destroyer," with fair promises, is leading us along paths that are dangerous though apparently easy. We are morally and spiritually ill, and thoughtful people are asking more and more what is the meaning of it all. It may be, as Dr. Bentley suggests, that we are suffering from a hormone deficiency; but this appears far-fetched. More likely the deficiency is not on the material plane, but is that we are lacking in those Christian virtues which contributed so much to the greatness of our country in the past, placing it in the vanguard of nations to this very day. By all means let us investigate, as these two doctors suggest, and let there be a meeting somewhere to discuss the question. I believe thousands of medical men, clergymen, and others would give their support.—I am, etc.,

Prestatyn, April 5th. W. Thomas.

Obituary

SIR ARCHIBALD GARROD

We are indebted to Sir FREDERICK GOWLAND HOPKINS, O.M., for the following appreciation:

A vivid interest in the chemical aspects of medicine was innate in Archibald Garrod, and remained with him to the last. It is of interest to remember that his father, Sir Alfred Garrod, made in 1848 what his son liked to recall as the first biochemical observation on the living human body—namely, that direct demonstration of the presence of uric acid in the blood of the gouty.

In the nineties of the last century, when the younger Garrod began his laboratory studies, the technique by which we now study quantitatively so many constituents of the blood and follow the chemical events in surviving tissues was not available, and those interested in metabolic phenomena were still led to look to the urine as a field for profitable study.

Garrod was early interested in urinary pigments, and having made himself expert in the use of the spectroscope he proceeded to make careful studies of various pigments as excreted in health and disease. The results were published in a series of papers appearing during a period of several years. In 1892 he described a study of haematoporphyrin excretion. He worked out an elegant method for the recognition of this pigment when present in very small amounts, and showed that in such amounts it is a normal urinary constituent. He found it in varying quantity in a large number of pathological cases, and he studied its properties in great detail. He next turned his attention to the chief yellow pigment of urine, which Thudichum had called urochrome, a name which Garrod accepted. It is remarkable that even to-day the source and exact nature of this prominent physiological product (or products ?) remain obscure. To Garrod, however, we owe most of our knowledge concerning its behaviour in the urine and a correction of many previous erroneous views concerning it. There followed a very interesting study of uro-erythrin, a substance familiar as the pigment in pink urate deposits. No light could be thrown on its actual chemical nature, but its quite exceptional properties were carefully described in much detail, and new facts concerning its behaviour were discovered.

In 1896 Garrod turned to a study of urobilin, and his papers on this constitute perhaps his most important contribution to the subject of urinary pigmentation. He described much that was new with regard to the properties and behaviour of the substance, and especially to its spectroscopy. An endeavour to obtain it in a pure state, in which the writer played a small part as a colleague, if not wholly successful, led to some points of interest, especially in establishing a notable difference between urobilin and the reduction product of bile pigment—hydrobilirubin. A little later Garrod dealt with an interesting phenomenon—the apparent conversion of urochrome into urobilin by the action of aldehyde. He showed that the effect was not due to the aldehyde itself but to small amounts of a product of its decomposition which appears when the aldehyde stands exposed to light. He showed further that the substance produced from urochrome, though in its spectroscopic behaviour astonishingly like urobilin, was not identical with the latter. All the work upon pigments so far mentioned, though wholly descriptive in kind, was carried out with meticulous care and accuracy, and the facts discovered stand firm.

It was just before the end of the century that—fortunately for biochemistry—Garrod's interests turned to the subject of alkaptonuria. It was his contact with this anomaly which led him to think so deeply, and to write so brilliantly, concerning what he came to call "chemical malformations," or "inborn errors of metabolism." He himself was able to describe a useful simplification of the method for separating from the urine the hydroquinoneacetic acid, which is the abnormal excretive in alkaptonuria. In 1899 he published an important paper on this anomaly in which the data recorded in all known cases were assembled, and which described two cases studied by himself. Emphasis was laid on the circumstance that the condition was not a disease but an individual variation from the normal; and, moreover, that its distribution is familial. It was later pointed out by Bateson and Punnett that its mode of incidence finds a ready explanation if it be regarded as a recessive character in the Mendelian sense. This increased Garrod's interest in the subject. His own further studies of cystinuria, and the efforts he made to gather and study all the data from the literature bearing upon these and analogous conditions, such as albinism and pentosuria, led to the publication in 1909 of his book *Inborn Errors of Metabolism*. A second edition appeared in 1923 in which new chapters dealt with instances of inborn metabolic defects unrecognized as such when the first edition was published. This book, so ably written and so full of interest, has stimulated the thought of many, and has to my knowledge led not a few students to seek a career in biochemistry. Its author's interest in the subject of the book never weakened. Among his later publications was one in which, conjointly with L. G. J. Mackey, he described a case of congenital haematoporphyrinuria, and another (with W. H. Hurtley) on congenital family steatorrhoea.

Garrod's leisure for personal laboratory research, while always small, practically disappeared when in 1903 he became assistant physician to his hospital. The urge to investigate on experimental lines never left him, however, and it is regrettable that he had to relinquish laboratory work at the very time when biochemistry, by developing its methods, was beginning to enter new fields of discovery and starting a period of rapid progress, which has continued till now. But Garrod never lost his scientific interests, and, as may be learnt from many of his public utterances, he kept touch with the progress of biochemistry as a pure science as well as with its medical applications.

His instinctive scientific attitude of mind was inherited, and is, it would seem, familial. His father, given opportunities, would have been an experimentalist of high rank, and his eldest brother, Alfred Henry Garrod, unquestionably attained to that rank. At Cambridge he was an investigator when still an undergraduate. It must have been rare indeed in the history of the Royal Society for a father and two of his sons to be received into its Fellowship.

The spirit of the investigator has again shown itself in the third generation, though in another field of research. Miss Dorothy Garrod has acquired a world-wide reputation as a prehistorian of high accomplishment.

While in the Regius chair at Oxford, Garrod always felt that the interests of the scientific departments should be his special care, and they profited from his wise advocacy of their claims.

With all his predilections for experimental science Garrod remained first and foremost a clinician, with a deep sense of the dignity and importance of that calling. When speaking, as he often did, of the help that modern medicine receives from science, he was always concerned to emphasize the view that this is but a repayment of the debt that science has owed to medicine. He held that all research with direct clinical bearings should be inspired by the clinician, who must always be the final judge as to its justification and value. He once said to me: "I fear, Hopkins, I have never been sufficiently interested in the routine treatment of disease." If this was

really the case it is sure that he never allowed either patients or pupils to suffer from the circumstance. If, in fact, he was one of those who find more instinctive pleasure in advancing knowledge than in applying it, this was a trait which was never allowed to interfere with his high professional standards. He had the philosophic spirit which enabled him to see life whole, with its duties and pleasures in right proportion.

When he came to live at Cambridge I much hoped that his interest in biochemistry would bring him often to my department. At first this was the case, but trouble with his eyesight, which soon became somewhat serious, and later a failure in his physical strength, made such visits difficult for him. I and my fellow workers thus unhappily lost a source of inspiration and encouragement.

MR. A. R. TWEEDIE

Mr. SYDNEY SCOTT writes: Within recent months the International Collegium of Oto-Rhino-Laryngology has had to mourn the loss of two of its most prominent British members. It is only a short time after the death of Dr. Albert A. Gray of Glasgow, one-time president of the Collegium, we have to record, with deep regret, the sudden loss of its treasurer, Mr. Alexander R. Tweedie of Nottingham. Tweedie was more than the official who collected subscriptions. His role was that of co-founder, organizer, and moving spirit, in association with Professor Benjamins, its honorary secretary, of Gröningen in Holland, where the inaugural meeting was held. Every year since the association has met, and whether at Zurich, London, Frankfurt, Prague, Bordeaux, Stockholm, or Budapest, Tweedie played his part on the council, and with his international colleagues helped to promote the spirit of amity and research. Twenty-two countries were represented by some 127 members, and the papers read were published in the *Acta Oto-Laryngologica*. Tweedie was right to be proud of the success of this little international body, in which he zealously worked with the inspiration that by it, and through it, he sought a way of attaining truth in the problems which beset the surgeon who attempts to alleviate those afflicted with diseases of the ear, nose, or throat.

Dr. DAVID MACKAY CASSIDY died on April 3rd in his ninetieth year. He was the eldest son of Lieut.-Colonel T. Cassidy, 72nd Regiment, and was one of three brothers, all of whom were doctors. During his boyhood his father was stationed in Canada, so he began his medical studies at McGill College, Montreal, of which university he was at the time of his death the oldest graduate. It was a great disappointment to him that ill-health prevented him from travelling to Montreal in 1925 in order to accept the honorary degree of LL.D., which the university then offered to confer upon him. After graduating at McGill he went to Edinburgh University, where he obtained the degrees of M.D., D.Sc. (Public Health), and the F.R.C.S.Ed. He was from the outset of his career interested in psychiatry, and soon after leaving Edinburgh he became assistant medical officer at the Inverness County Asylum. He was regarded as a young man of exceptional brilliance, as will be realized by the fact that at the early age of 25 he was appointed deputy medical superintendent under Dr. Orange at Broadmoor. Five years later, in 1876, he became medical superintendent to the County Asylum at Lancaster, which was one of the largest institutions of its kind in the kingdom. This important post he held with distinction for a period of no less than fifty years, for, at the earnest request of his committee, he did not retire till the year 1926, at the age of 79. He was a progressive administrator, for he was a pioneer in the introduction of female nurses for male mental cases, and Lancaster was one of the first mental hospitals to be equipped with a pathological laboratory and an *x*-ray installation. In recognition of his work at Lancaster Dr. Cassidy was created C.B.E. in 1925. He married Miss Helen Angus, who predeceased him. He leaves three daughters and two sons, both of whom are members of the medical profession, the elder being Sir Maurice Cassidy, senior physician to St. Thomas's Hospital.

Dr. THOMAS MAJOR TIBBETTS of Cradley Heath died suddenly at the age of 67 on March 13th, after an active and useful professional life, during which he was well known in Staffordshire as an energetic practitioner and a keen sanitarian. He received his medical training at Queen's College, Birmingham. In 1892 he graduated M.B.Lond. with honours in obstetric medicine, and obtained the diplomas M.R.C.S., L.R.C.P. Four years later he took the diploma of public health of the English Royal Colleges, and proceeded M.D. in 1908. After holding the post of resident medical assistant to the Birmingham General Hospital he began practice in Cradley Heath, and was for forty years medical officer of health to the Quarry Bank U.D.C. He was also medical officer and public vaccinator for No. 2 Rowley Regis district, surgeon to the police, medical referee for various assurance societies, chairman of the Dudley Panel Committee, and member of the Stafford County Panel Committee. This wide experience, coupled with his pioneering nature, enabled him to be an effective reformer in many directions. His reports as medical officer of health were often incisively worded, and he did not relax his efforts until the projected reforms came to pass. In 1916 he published a lucid, stimulating, and instructive book on the duties and perplexities of a panel doctor. He also contributed articles to medical periodicals on clinical and public health topics. He was a Fellow of the Society of Medical Officers of Health. Joining the British Medical Association in 1895, he brought to it the same zealous service, and in 1932–3 was president of the Birmingham Branch. Dr. Tibbetts is survived by his widow, a daughter, and three sons, one of whom was practising in partnership with him.

We regret to report the death on March 20th of Dr. CLARENCE JAMES MIDDLETON, lately of Abertillery, but formerly in practice in Australia. Born fifty years ago in Sydney, New South Wales, he came to Great Britain in 1909, and studied medicine at Edinburgh. He took the triple Scottish qualification in 1917, and held a commission in the R.A.M.C., with which he saw active service in Mesopotamia. For some time subsequently he was a ship surgeon, and travelled several times to South Australia. Eventually he practised for a time in Newcastle, New South Wales, but returned to this country in 1933, and settled in Abertillery, where he became very popular. Of splendid physique and over six feet in height, Dr. Middleton had been a fine athlete in his youth, and retained a robust health and vigorous personality. He gave himself energetically to the service of the many who were exhausted by the struggle against the prevailing poverty and depression, and his unexpected death has caused widespread sorrow. He joined the British Medical Association in 1919. One of his colleagues in Abertillery is Dr. Robert E. Burns of Melbourne and Perth. Dr. Middleton, who was unmarried, is survived by his mother and a sister.

The death has occurred in an Edinburgh nursing home of Dr. WILLIAM TURNER, M.V.O., O.B.E. Born at Keith, Banffshire, in 1856, the son of Dr. Robert Turner, he received his early education at Keith Grammar School, proceeding afterwards to Aberdeen University, where he graduated Master of Arts in 1876. He studied medicine at the University of Edinburgh, taking the M.B. and C.M. degrees in 1879 and M.D. in 1881. He held the posts respectively of non-resident physician in the Royal Infirmary and resident physician in the Royal Hospital for Sick Children, Edinburgh, and resident accoucheur in the Glasgow Maternity Hospital; and in Edinburgh was for

some time assistant in general practice to Dr. Angus Macdonald, and was later associated with Dr. Alexander Bruce. In 1882 he received the appointment of surgeon to the Colonial Hospital at Gibraltar, which post he held until 1914, acting also in the capacity of medical officer to the asylum and prison medical officer ; and he was chief medical adviser to the Colonial Government at Gibraltar. In addition he had an extensive general and consulting practice in Algeciras. During the war from 1914 to 1919 he was principal medical officer at Milton Hill War Hospital, Berks. He was a Fellow of the Royal Society of Medicine and of the Royal Geographical Society ; was a diplomate in medicine and surgery of the University of Madrid ; and held the Médaille Militaire du Roi Albert. Dr. Turner joined the British Medical Association in 1888, and was a member of the Central Council in 1899–1900. He was the author of various articles on conditions at Gibraltar, and made several contributions to current medical literature. Fishing and golfing were his chief recreations, and after his retirement he travelled extensively round the world. He was unmarried.

Dr. NORMAN HALIBURTON HUME died at Brecon on March 29th, where he had been in practice since 1921. His father was the late George Haliburton Hume, F.R.C.S., of Newcastle-on-Tyne, where he was born in 1871, and his brother is Professor W. E. Hume, physician to the Royal Victoria Infirmary, Newcastle. From Uppingham he entered as a medical student at the Newcastle School of Medicine, and continued his studies at the London Hospital, graduating M.B., Ch.B. at the University of Durham in 1904, and obtaining the M.R.C.S. and L.R.C.P. diplomas in the following year. He joined the Indian Medical Service in 1906, and while in India held several administrative and medical appointments. During the war he was on the Afghanistan frontier, and in 1918 had to be invalided down the line with pneumonia and empyema. His chief work in India was in connexion with the General Hospital, Calcutta, where he was administrator and surgeon. In this post he gained very considerable surgical experience. In 1921 he retired from the I.M.S. with the rank of major, and settled in practice with Dr. T. P. Thomas at Brecon ; after Dr. Thomas's death in 1930 he entered into partnership with Dr. D. Leonard Lees. During the fifteen years of practice in Brecon he did all the surgical work in the Brecon County Hospital, and his operation lists were frequently comparable to those in any general hospital, as his experience in India qualified him to undertake all the operations of general surgery. In Brecon he made himself loved and respected by all who came in contact with him. He played a prominent part in the decision to erect a new hospital in Brecon as a War Memorial instead of enlarging the old one, and since the opening of the new hospital in 1928 until his death he took the greatest interest in it and its work. Soon after coming to Brecon he was appointed surgeon to the King Edward VII National Memorial Sanatorium at Pontywal, and in 1930 he succeeded the late Dr. T. P. Thomas as medical officer to Christ College, Brecon. Dr. Hume joined the British Medical Association on taking up civilian practice, and was chairman of the North Glamorgan and Brecknock Division in 1928–9. He was a keen sportsman, particularly fond of fishing, but the exigencies of his practice did not allow him to devote much time to it. He will be sadly missed.

The following well-known foreign medical men have recently died: Dr. EDWARD B. HECKEL, formerly chairman of the board of trustees of the American Medical Association and a prominent ophthalmologist, aged 70 ; Dr. WILHELM HENNEBERG, honorary professor at the University of Kiel and for many years director of the bacteriological milk institute, aged 65 ; Professor EMIL HEYMANN, formerly director of the surgical department of the Augusta Hospital, Berlin, and an authority on brain surgery, aged 58 ; and Professor LUDWIG MANN, a prominent Breslau neurologist, aged 70.

Universities and Colleges

UNIVERSITY OF ABERDEEN

The following degrees were conferred on April 1st:

M.D.—*J. Findlay, *M. McI. Milne.

M.B., CH.B.—A. A. N. Bain, L. G. Boyd, J. G. Byth, J. S. Cruickshank, L. Findlay, Margaret A. Hay, W. Wilson.

D.P.H.—H. Morrison, M. J. Schultze.

* Commended for thesis.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At the monthly meeting of the College, held on April 3rd, the following successful candidates at the Conjoint Final Examination with the Royal College of Surgeons in Ireland were admitted to Licences in Medicine and Midwifery:

I. J. Eppel, R. Jacob, S. Jacob, W. K. McGinley, Alice L. Myles, M. P. G. O'Brien, Catherine M. Rogan, L. J. Samuels, M. A. Tierney, C. J. F. Warner.

A letter was read from the honorary correspondence secretary of the Biological Society of the Royal Colleges of Physicians and Surgeons thanking the College for the offer to present a medal to the Society.

John Alexander Wallace, M.B., M.R.C.P.I., was elected a deputy for the King's Professor of the Institutes of Medicine to act as clinical physician at Sir Patrick Dun's Hospital, Dublin.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

In the House of Commons on April 6th, on a vote of confidence about a debate on foreign affairs and on pay of women in the Civil Service, the Government was supported by 361 to 145.

The second reading of the Midwives Bill is postponed till after the Easter Recess. The delay is not thought to endanger the Bill.

In the House of Lords on April 6th the Unemployment Insurance (Agriculture) Bill passed through the report stage.

Radium Supplies

On April 2nd Mr. ROSTRON DUCKWORTH asked whether the attention of the Minister of Health had been called to the statement by the Radium Commission that the present condition of radium supplies in the country presented a serious problem ; and whether any steps could be taken to increase the supply of this commodity for the benefit of the hospitals. Assuming that Mr. Duckworth referred to the sixth annual report laid before the National Radium Trust by the Radium Commission, Sir KINGSLEY WOOD replied that the Trust had this report now under consideration, but was not yet able to state its proposals. Dr. DUCKWORTH asked whether Sir Kingsley would consider an application for further grants from the Government for this service. Sir KINGSLEY WOOD answered that he must await the consideration by the Trust.

Sunday Opening of Chemists' Shops

During the examination of the Shops (Sunday Trading) Bill in Standing Committee, amendments were brought up by Sir ARNOLD WILSON and Mr. W. W. WAKEFIELD which were intended to exempt from the application of the Bill either all registered chemists and druggists or those required by national health insurance committees to keep their premises open on stipulated Sundays. Sir Arnold Wilson proposed his amendment on March 26th. Discussion continued on March 31st, when Mr. GEOFFREY LLOYD, for the Home Office, said he did not think chemists' employees should be excluded

generally from the compensatory holiday for Sunday work. It was understood that there was a rota of chemists for Sunday attendance, so that a particular chemist need not open every Sunday. The Home Office saw no objection to employment of qualified assistants in chemists' shops which were required to open on Sunday under a contract with an insurance committee provided an assistant was not employed more than two hours. SIR ARNOLD WILSON withdrew his amendment, and Mr. WAKEFIELD moved one in which the exemption was restricted to the case to which Mr. Lloyd said the Home Office did not object. The committee voted 12 for the amendment and 12 against, and the chairman gave a casting vote for its rejection. During the discussion Mr. Wakefield said there were some 22,000 qualified pharmacists and chemists, of whom 7,000 were in the wholesale trade and some 8,000 or 9,000 were in retail business on their own account.

Women's Pay in the Civil Service

On a motion that the Speaker leave the Chair to enable the House of Commons to go into committee on the Civil Estimates, moved on April 1st, Miss WILKINSON brought forward as an amendment a declaration in favour of placing women employed in the common classes of the Civil Service on the same scales of pay as apply to men in those classes. She said the Treasury calculated the sick leave of women to be 50 per cent. higher than that of men. That actually meant that women's average sickness leave was twelve days, to the men's eight days. Major J. W. HILLS repeated these figures, and said that women who lost time by sickness were chiefly in the clerical and writing assistant classes. The sickness was chiefly among the younger girls. Mr. PETHICK LAWRENCE said the difference, according to a later investigation by the Treasury in 1934, was now only 20 per cent., one or two more days' sick leave yearly. Sir ERNEST GRAHAM-LITTLE said medical papers four or five years ago showed there was no proof that a much larger proportion of women were invalided. Mr. W. S. MORRISON resisted the proposal. The motion that the Speaker leave the Chair was rejected by 156 to 148, but Miss Wilkinson's proposal was defeated by 149 to 134. On the following day Mr. BALDWIN promised that another opportunity would be given on April 6th to debate the demand for equal pay.

In the House of Commons on April 6th Mr. BALDWIN asked for the support of the House as a matter of confidence, and said that the proposal of equal pay for men and women in the Civil Service would be a retrograde step. If put into effect now it would throw back a great deal of the progress made by women in recent years. The Prime Minister's motion was carried by 361 to 145.

Clerical Work of Insurance Practitioners

On April 6th Commander LOCKER-LAMPSON asked the Minister of Health if he was aware that doctors with large panel practices were overburdened with the clerical work involved in registering their patients and filling in forms, and whether, as this non-medical work adversely affected the capacity of doctors to cure, as well as injuring their health, he would take steps to make a small grant to doctors with large panel practices to enable them to afford clerical assistance. Mr. SHAKESPEARE said that the Minister of Health was not aware that insurance doctors were overburdened with the clerical work to which Commander Locker-Lampson referred. Account was taken of this necessary part of their work when their capitation fee was fixed.

Refugee German Doctors in Britain

Mr. C. S. TAYLOR, on April 2nd, asked whether the Home Secretary knew that alien refugees permitted to reside in this country for the purpose of obtaining British medical qualifications were taking up appointments in this country; and what steps he proposed to take to stop this practice, in view of undertakings given by the Home Office. Mr. GEOFFREY LLOYD replied that since March, 1935, refugees who applied for permission to reside in this country for the purpose of medical study had been informed that permission could only be granted on the clear understanding that after qualifying they would not be allowed to establish themselves in medical practice in the United Kingdom, but would be expected to leave the country. Among refugee doctors who came before that date there was a limited number to whom it had been thought right, on various special grounds, to grant permission to practise in this country after they had obtained a British medical qualification and been admitted to the British *Medical Register*. The number of cases in which such permission had been granted was 148. In some cases of eminent medical men having special attainments their colleagues in this country asked for them to be allowed to practise here.

Mr. WATKINS asked whether those not regarded as special cases were forced to go back to Germany and suffer persecution? Mr. LLOYD: No, Sir, not necessarily, but His Majesty's Government has to consider first of all the interests of British subjects.

Mr. DALTON: Would it not be possible to send some of these people to Palestine, where their services are badly needed? Mr. LLOYD: My information is that there is already an overplus of doctors in Palestine.

Newspaper Wrappers for Food.—Mr. CHARLES TAYLOR, on April 2nd, asked whether, in view of the uneasiness of certain branches of the medical profession at the practice of retail butchers and fishmongers of purchasing old newspapers for the purpose of wrapping up meat and fish sold in retail shops, the Minister of Health would consider making further investigations on the advisability of action to stop this practice. Sir KINGSLEY WOOD answered that on general grounds of cleanliness the practice was to be deprecated, but there was no definite evidence that it was a factor in the spread of disease. He did not think further investigation necessary.

Bombing of Red Cross.—Mr. EDEN, on April 1st, summarized a report from the British consul at Harar about the bombing of that town by Italian aircraft on March 29th. According to this report, fifty bombs fell on the compound of the Egyptian Red Cross, four on the French hospital and agency, and four on the Harar Red Cross, destroying a ground sign five yards square. The number of casualties was small.

Mr. EDEN, replying on April 6th to Mr. Kennedy, who asked what action had been taken in regard to the use by the Italian forces in Abyssinia of asphyxiating gas and attacks by aircraft on Red Cross units, stated that the Committee of Thirteen had decided to refer the complaints of the Ethiopian Government to the Italian Government. In view of the importance of guarding against violation of the laws and customs of war relating to the protection of non-combatants, the British Government was making urgent representations that the complaints made by the Ethiopian Government about the bombing of open towns should receive immediate attention from the appropriate organ of the League.

Alleged Mental Ill-health among Cotton Workers.—On April 6th Mr. SHAKESPEARE told Mr. Kennedy that the Minister of Health had been informed of the discussions at a meeting of the Lancashire Public Assistance Committee on Monday in last week at Preston, which alleged an alarming increase of mental trouble requiring public treatment among cotton workers. He had read the report of a commissioner of the Board of Control which referred to this matter. There was nothing in the report to the effect, as was suggested in Mr. Kennedy's question, that the Commissioner attributed the increase of mental trouble to malnutrition, unemployment, and the operation of the means test. The question of action did not therefore arise.

Medical Treatment of War Pensioners.—On April 6th Mr. R. S. HUDSON informed Sir Edward Ruggles-Brise that the Ministry of Pensions was in touch with pension authorities abroad, and published information was regularly collected. He had, however, felt it desirable to cause study to be made on the spot of the experience of other countries in regard to a number of points connected with the administration of pensions and the medical and surgical treatment of the war-disabled. For this purpose three of the principal officers of his Department were at the moment about to visit both Germany and France.

Medical News

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, April 15th, at 5.30 p.m., when Dr. E. E. Jelley will read a paper and Mr. S. Borthwick will exhibit and describe a new microprojector and a new binocular microscope.

A joint meeting of the Sections of Psychiatry and Disease in Children of the Royal Society of Medicine will be held at 1, Wimpole Street, W., on Tuesday, April 21st, at 8.30 p.m., when there will be a special discussion on "Enuresis," to be opened by Dr. William Moodie and Dr. Reginald Miller.

A sessional meeting of the Royal Sanitary Institute will be held in the Guildhall, Swansea, on Friday, April 17th, at 2.30 p.m., in conjunction with the Welsh Branch of the Society of Medical Officers of Health. Discussions will take place on "The Co-ordination of General Hospital Services and the Provision of Additional Accommodation," to be opened by Professor R. M. F. Picken, and on "The Co-ordination of Housing, Rehousing and Redevelopment under the Housing Acts with Regional and Town Planning," to be opened by Mr. Walter Hunter.

The County of London branch of the British Red Cross Society has arranged a course of seven lectures and a practical demonstration for members of the medical profession and trained nurses on air-raid precautions. These will be given on Fridays at 5 p.m., beginning on May 1st, at 9, Chesham Street, Belgrave Square. The course will be conducted by Major H. N. Stafford, O.B.E., *M.C.*, R.A.M.C. Fee for the course is 7s. 6d. Entries should be made and fees paid not later than April 25th. Inquiries should be addressed to, and cards of admission may be obtained from, the County Secretary, British Red Cross Society, 9, Chesham Street, S.W.1.

A post-graduate course for candidates taking the D.L.O. examination will be held at the Central London Throat, Nose and Ear Hospital, Gray's Inn Road, W.C., from April 27th to May 23rd. Part I of the course consists of lectures embracing the anatomy, embryology, histology, and physiology of the ear, nose, and throat, etc., and Part II clinical demonstrations. The fee for Part I is £5 5s., and for Part II £10 10s. A limited number will be admitted to the peroral endoscopy class (£6 6s.) and the pathology class (£5 5s.). Full particulars may be obtained from the secretary of the hospital.

The Fellowship of Medicine announces the following courses: proctology at St. Mark's Hospital, April 20th to 25th; ophthalmology at Royal Eye Hospital, April 20th to May 1st; medicine, surgery, and gynaecology at the Royal Waterloo Hospital, April 27th to May 9th; psychological medicine at Maudsley Hospital, April 27th to May 30th; dermatology at St. John's Hospital, May 1st to 29th; thoracic surgery at Brompton Hospital, May 11th to 16th; urology at St. Peter's Hospital, May 18th to 30th; proctology at Gordon Hospital, May 25th to 30th; venereal diseases at London Lock Hospital, May 25th to June 20th; heart and lung diseases at Victoria Park Hospital, April 18th and 19th; infants' diseases at Infants Hospital, May 2nd and 3rd; chest diseases at Brompton Hospital, May 9th and 10th; surgery at Cancer Hospital, May 16th and 17th. Courses arranged by the Fellowship of Medicine (1, Wimpole Street, W.) are open only to members and associates of the Fellowship.

H.R.H. the Princess Royal, Commandant-in-Chief of British Red Cross Detachments, has promised to present the Stanley Shields to the successful teams at the finals of the society's national competitions in first aid and home nursing, at the Wharncliffe Rooms, London, on May 6th.

A play by Dr. E. H. M. Milligan, entitled *'Twas in Old Ireland—Somewhere*, will be broadcast from the new powerful Northern Ireland transmitter on the evening of Friday, April 24th. Earlier plays by Dr. Milligan, who is the honorary secretary of the Glossop Division of the British Medical Association, were broadcast on June 3rd, 1933 (*The Ballad Singer*), September 18th, 1934 (*Muggleston on the Map*), and November 8th, 1935 (*The Mayor Chooses a Wife*). The last two were written in collaboration with Mr. A. V. Williams.

A stone memorial to 160 doctors, physicists, chemists, and nurses who lost their lives as a result of working with *x* rays was unveiled at Hamburg on April 4th. The inscription on the memorial reads: "They were heroic pioneers for a safe and successful application of *x* rays to medicine. The fame of their deeds is immortal." A Reuter's message from Berlin gives the following list of British names inscribed on the monument: R. G. Blackall, C. R. C. Lister, Melville H. Walsham, C. Williams, E. E. Wilson, W. H. Fowler, J. S. Hall-Edwards, J. W. L. Spence, J. R. Riddell, W. I. Bruce, Pirie.

The President of the French Republic has conferred on Sir Henry Wellcome, LL.D., F.R.S., la Croix d'Officier de la Légion d'Honneur.

Dr. Hugh S. Cumming, the fifth surgeon-general of the United States Public Health Service, has recently retired owing to ill-health.

Dr. J. B. Wilkinson, who has just completed thirty-eight years of service as medical officer of health for Oldham, has intimated his wish to retire at the end of May.

With the January issue the name of the journal formerly known as *Archives de Médecine et de Pharmacie Militaires* has been changed to *Revue de Service de Santé Militaire*.

The Rumanian Minister of Public Health has decreed that all practitioners in towns with a population of more than 50,000 inhabitants must attend post-graduate courses for three to five weeks every five years.

More than 4,000 persons in the Spanish province of Murcia have recently fallen ill after consumption of bread which was found to contain large quantities of lead salts. The number of deaths has not been reported.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

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MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin).

QUERIES AND ANSWERS

Hardening Drinking Water

"G. D. T." writes: I should be grateful for information about any method, preferably automatic, of hardening drinking water. The water in this district is upland surface water, and a patient who has recently come to live here does not like it. As she is suffering from active pulmonary tuberculosis I feel that any extra lime in the diet may help her condition.

Stammering

Dr. GEORGE C. CATHCART (London, W.1) writes: I have read with interest the opinions of "Cured Stammerer," "Exsta," and Mr. Rumsey in the last three issues of the *Journal*. In my opinion stammering is a neuro-muscular upset in the mechanism of speech. It is true that stammerers may develop what is termed an "inferiority complex," but this is the result of the stammering, not the cause. I agree with "Cured Stammerer" that the co-operation of the patient is essential. My experience of the treatment of stammerers has taught me that the first step is to teach the stammerer how to relax, so that he may be able to do it at will. The next step is to teach him to breathe properly. The last and most important step of all is to teach him to form the "breath or voiceless consonants" not by making use of the breath from the lungs, but by compressing the air in the pharynx, and so causing no interruption of the sustained sound of the vowels. By following these simple rules the cure of stammering becomes a matter of comparative ease.

Dr. TOM A. WILLIAMS writes from Bordighera, in reply to "Exsta" (March 21st, p. 624): The psychotherapy of stammering from timidity is dealt with in part in my book *Dreads and Besetting Fears* (Methuen, 1925), now out of print, except in the American edition (Little, Brown and Co.). The procedures used in a particular case are given in some detail. But of course there are other forms of stammering where different methods are required.

Chromidrosis

"ANGUS" writes: With reference to the correspondence by Dr. Gibb on February 29th (p. 455), and "BM/CLMH" on March 28th (p. 677), full particulars of the disease they are interested in will be found in any large dermatological textbook (for example, Darier, McLeod, Sutton, etc.) under the headings of leptothrix and trichomycosis.

Recurrent Herpes Labialis

"J. H. D. W." replies to "C. L. F." (April 4th, p. 735) that in one patient, resistant to many local applications, "antipeol" ointment has proved both preventive and curative (the latter if it has been forgotten or has not been available when a nose or throat catarrh has come on away from home). *X* rays have not been tried for herpes, but in the same patient 10 per cent. doses have led to healing in a few days of a persistent crack at the angle of the mouth (twice at several years' interval).

Cess-pit Filtration

"S. S." (Bristol) has an overflow chamber from a cess-pit. The chamber is cut into the subjacent rock, through which the fluid contents should percolate. It is said that this filtration may be interfered with by the formation of a mucinous film or deposit on the face of the rock. Can any reader give a practical means—chemical or otherwise—of preventing the formation of such a film? Does the addition of sulphate of iron—to prevent odour—increase or diminish the film formation?

Income Tax

Allowances

"AESCULAP" is a married man with a daughter who has an income of £30 per annum and was being educated at a university up to November, 1935. His only income for 1935–6 is £612 unearned income taxed at the source. What allowances can he claim?

*** The calculation is as follows:

	£	s.	d.
Personal allowance £170 at 4s. 6d.	38	5	0
Child allowance £50 at 4s. 6d.	11	5	0
Reduced rate relief £135 at 3s.	20	5	0
	£69	15	0

Sale of Part of Practice

"E. X." is dissolving partnership on March 31st, and instead of taking in a new partner will sell the greater part of the practice. He has been asked to supply an account showing the profits for the period from January 1st, 1935, to March 31st, 1936.

*** The old practice must be regarded as having ceased as at March 31st, 1936, and consequently the Revenue is entitled to revise the assessments for 1934–5 and 1935–6 to the amount of the earnings of the current year instead of the previous year. (This is the counterpart of the taxpayer's option to a similar revision in the early years of a commencing practice.) "E. X." is therefore advised to comply with the request of the inspector of taxes.

LETTERS, NOTES, ETC.

Saline Transfusion in the Treatment of Diphtheria

Dr. GILBERT BURNET (medical superintendent, Isolation Hospital, Hemel Hempstead) writes: I have been so impressed by the success of glucose saline administration in a case of almost hopeless diphtheria that I would like to hear more of its trial in our larger fever hospitals. A child of 6 was admitted to my care from a home where two children had already died after a few hours' illness. Although a large dose of diphtheria antitoxin separated the membrane within thirty-six hours, serious symptoms rapidly developed. Vomiting persisted to such an extent that the child's systolic pressure fell to 80, and in spite of rectal glucose saline she became so dehydrated as to appear almost moribund. At this stage an intravenous saline with 2 per cent. glucose was tried with success, which led to complete recovery. If I had to deal with many such cases I would institute continuous drip intravenous as a routine. I would give perhaps 2 per cent. glucose saline by the apparatus suggested by Farquharson, and using the internal saphenous vein near the ankle would be able to control the apparatus at the foot of the bed. The piercing of the rubber tubing by the serum needle would provide ready access for antitoxin in whatever dose or doses it was thought desirable. Atropine, strychnine, adrenaline, or any other drug could be readily administered by the nurse through the same channel if required, and the continuous drip of twenty to thirty drops of the solution per minute could be continued until all danger of toxaemia had passed.

Eye Health Taught by Film

Instruction in the care of the eyes is to be given throughout the country in a film entitled "Do You See?" which has just been completed by the National Ophthalmic Treatment Board. The film depicts in story form the need of watchfulness against eye-strain under the high-pressure conditions of modern civilization. It also emphasizes the danger of receiving eye treatment from anyone but a qualified eye specialist. One sequence of the film deals with the history of spectacles from the first crude examples of the Middle Ages down to the scientific frames and lenses of to-day. Another shows the activities of the National Eye Service centres, which the Board has established all over the country in co-operation with the British Medical Association, and which provide for examination of the eyes of persons of limited means by medical eye specialists at a nominal fee.

Disclaimers

Mr. H. N. FLETCHER (Hove) writes: There was published last week in a local paper a laudatory article on a case in my wards at the Royal Sussex County Hospital—an article in which my name appeared as the surgeon in charge of the case. Such personal references must always be distasteful to those unwittingly involved, and it is the more so to me in that in the evening before the article appeared I was rung up at my house by a reporter, who said that he had had an interview in hospital with the patient, and asked for my verification of her accident, treatment, and recovery, and if I had any objection to the interview being published. I said No, provided that no reference whatever was made to me personally, if such he had in mind. The result was as I have stated. It is a warning not to put one's trust in those seeking for "news copy" which I commend to others who might be involved as I have been.

Dr. BETHEL SOLOMONS (Dublin) writes: I note in the *Journal* of March 28th several disclaimers with reference to articles in the lay press, and I wish to add another. Having reported to the Royal Academy of Medicine in Ireland a unique operation of grafting a piece of endometrium and ovary in the same patient with good results, these transactions were reported as a routine in the *British Medical Journal*. Within a few hours of publication in London on the Friday I was rung up from London and elsewhere by numerous lay newspapers for further information. I refused all interviews and all information. In spite of this many lay journals reported the case, and some of them with gaudy and garbled accounts of their own.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 46, 48, 49, 51, 52, 53, and 56 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 54 and 55.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 148